Provincial Nature Reserves in Ontario

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Parks and Recreational Areas Branch, 1981

Ontario
Ministry of Natural Resources
Hon. James A.C. Auld
Minister
W.T. Foster
Deputy Minister

Acknowledgements

Many individuals have contributed to the evolution of Nature Reserves and Nature Reserves policy in Ontario. This document gratefully acknowledges those who pioneered and advanced the concept of protecting examples of Ontario's natural heritage. Special thanks are due to the members of the Minister's Advisory Committee on Nature Reserves (1969-1972) and the Ontario Committee of the International Biological Programme (1968-1973). Nature Reserves policy in Ontario has been more a product of collective thought than of individual effort. It is hoped that this document will stimulate continued co-operation among all concerned.

Preface

Provincial Nature Reserves, like other Provincial Parks, are administered by the Ministry of Natural Resources, but they have certain special characteristics which set them apart.

This booklet describes Nature Reserves through a series of questions and answers. The questions deal with the character of Nature Reserves, the need for them and the methods of selecting and managing them.

Descriptions of individual Nature Reserves are appended.

Contents

◀ The Niagara Escarpment is one of many outstanding natural features in Ontario.

Introduction: Man and Ontario's Natural Legacy

2 An example of early Precambrian sedimentary rock, crosscut by injections of igneous rock.

3 Bedrock of Paleozoic age underlies much of the Great Lakes-St. Lawrence Lowlands.

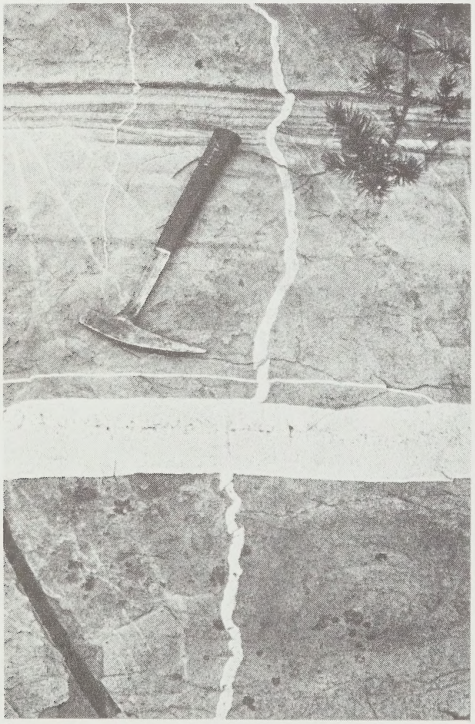
4 Bogs and fens over marine clays and Paleozoic bedrock characterize the Hudson Bay Lowlands.

Ontario's natural boundaries extend from the Laurentians to the Prairies, and range from sub-arctic tundra to southern deciduous forest. Within this vast setting can be found a rich and varied natural legacy.

The oldest bedrock of Ontario was formed during the Precambrian era, between 4,500 million and 600 million years ago. It includes some of the oldest rocks in the world. The Hudson Bay Lowlands and the Great Lakes-St. Lawrence Lowlands, however, are underlain by more recent sedimentary rock of Paleozoic age. This sedimentary rock was formed between 600 million and 360 million years ago.

During the Ice Ages, which occurred within the last million years, glaciers scraped and scoured the land surface, thus greatly re-shaping the landscape of the Province. Ontario's diverse landscape includes parts of the Hudson Bay Lowlands, the Canadian Shield, four of the five Great Lakes, the Niagara Escarpment, and a myriad of lakes and rivers.

Along the shoreline of Hudson Bay lies one of the southernmost stretches of tundra in the world. South of this is the vast boreal forest and, still farther south, an extensive mixed coniferous and deciduous forest in the region of the upper Great Lakes. Adjacent to Lake Erie are fragments of a



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5 Winds and moving sand, forming dunes, represent one of many active Great Lakes shoreline environments.

6 The La Cloche Hills in Killarney Provincial Park represent one of the distinctive physiographic regions of the Precambrian Shield.

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deciduous forest that is centred in the eastern United States.

Ontario has a diverse range of wildlife. Favourable habitats in northwestern and southwestern Ontario support prairie species while, in southeastern Ontario, plants and animals characteristic of the Atlantic seaboard are found. Distinctive plants and animals also occur along the Great Lakes shoreline, the Niagara Escarpment and the Hudson Bay Lowlands.

Bedrock, landforms, climate, plants, and animals: all are interrelated. If one element is destroyed, or even disturbed, the whole is inevitably altered.

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7 The fox snake is an example of a species declining in numbers due to habitat loss, and also due to indiscriminate destruction. Nature Reserves can provide habitat to protect such non-migratory species with a limited home range.

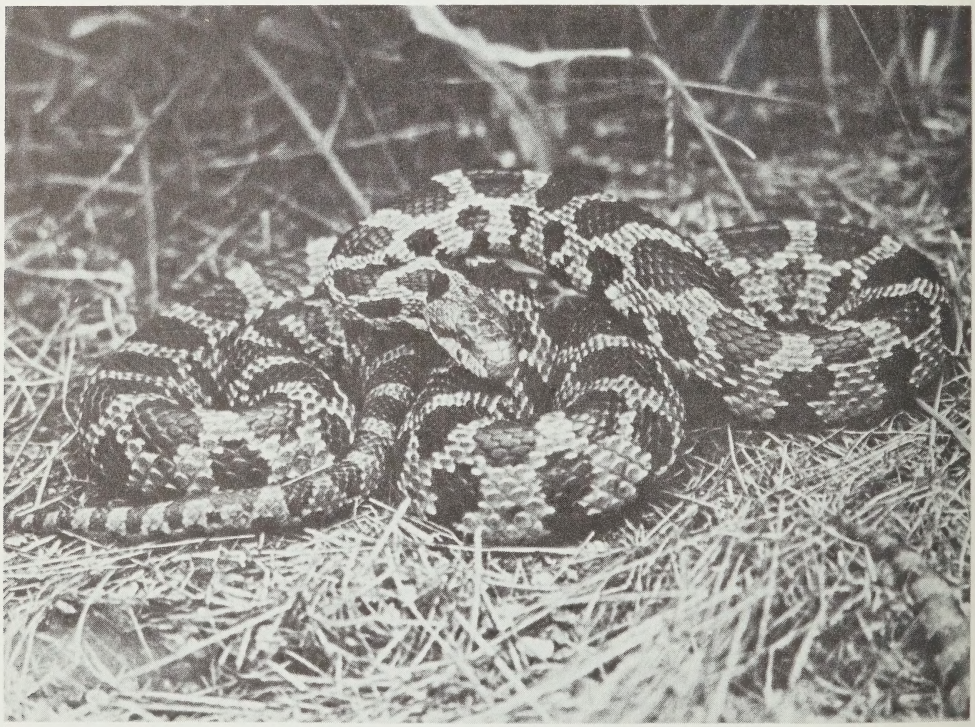
Recently, man has developed the powers to bring about environmental changes on a scale which was reserved formerly for natural processes. Population explosion and the increase in knowledge, technology, economic activity and natural resource consumption have drastically changed our world.

There is a danger that, by over-using our natural resources, we will alter the delicate fabric of nature upon which our existence depends.

One irreversible effect that man has had on the natural world is the extinction of many species. It has been estimated that close to 400 birds and mammals have become extinct throughout the world since 1600, and that about 1,000 more are threatened, mostly because of man. Many thousands of flowering plant species are thought to be in danger of extinction as well. Even landforms, once thought indestructible, have become endangered.

In Ontario, several plant and animal species have been eliminated, and a number of others are in critical danger.

Ontario's vast natural heritage may seem safe. It is not. In southern Ontario, the once extensive forests have been reduced to isolated woodlots. Much of the remaining vegetation is threatened by urbanization and by modern agricultural practices which



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8 Many wetland environments found in southern Ontario are threatened with drainage and development.

9 The yellow fringed orchid (*Platanthera ciliaris*), once native to marshes on Pelee Island, is now believed to have been extirpated in Ontario.

10 Sand and gravel extraction consumes important elements of Ontario's natural history.

eliminate woodlots and hedgerows. Many wetlands in southern Ontario have been filled in or dredged. Glacial landforms and other geological features continue to be deformed by roads, urban development and mineral extraction. In northern Ontario, natural resource utilization cuts into remaining natural areas.

Although opportunities to protect Ontario's natural heritage are diminishing, man may yet save examples of what remains. Nature Reserves are one means of doing this.

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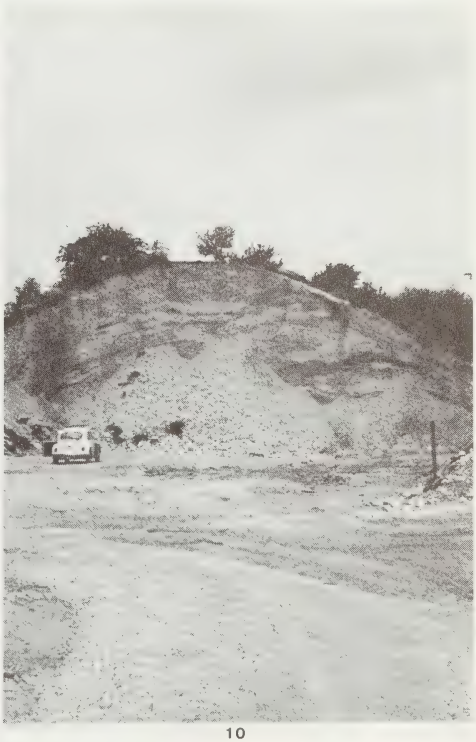

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What Are Nature Reserves?

11 Nature Reserves are established to protect representative examples of Ontario's natural heritage. This sign was erected to indicate the Nature Reserve status of this Lake Erie island.

12 Nature Reserves provide opportunities for passive recreation and study.

Nature Reserves are Provincial Parks selected to represent the distinctive wildlife, natural habitats, bedrock and landforms of the Province. They differ from other classes of Provincial Parks in the special degree of protection they are provided.

The features within Nature Reserves are protected for educational purposes and for research which will benefit present and future generations. Visitors may come to Nature Reserves for study or tranquil relaxation, but only facilities necessary for access are provided.

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Why Are Nature Reserves Needed?

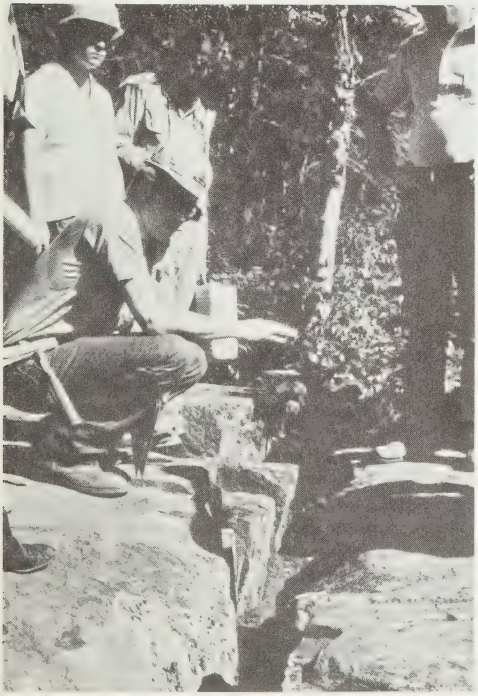
13 Nature Reserves provide opportunities to learn about natural features and processes through organized groups or through self-discovery.

14 The features which Nature Reserves protect range from the commonplace to the spectacular.

Nature Reserves serve many purposes. They are places for the quiet appreciation and study of nature. They serve as outdoor classrooms for teachers. They are areas against which the effectiveness of resource management techniques employed elsewhere can be evaluated. They also serve as control areas for scientists engaged in furthering our knowledge of natural processes.

Nature Reserves help to preserve evidence of our biological and geological history. Earth science features tell of the origin and structure of the planet, of climatic change ranging from the extreme cold of the Ice Ages to tropical conditions, and of marine seas and vast inland lakes. Long extinct fossilized and petrified life forms show the evolution of life, from micro-organisms largely unchanged over hundreds of millions of years to highly sophisticated, relatively recent species and communities.

But there are even more fundamental reasons for having Nature Reserves. Man relies on plants and animals not only for food but for medicines, chemicals and fibres. Nature Reserves help to ensure that species are perpetuated since new uses for plants and animals continue to be discovered. There is also potential for the protection of ancestral stocks of many domesticated species. New varieties may be grown from these, and important discoveries made about them.



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The evolution of life on our planet depends upon the diversity of natural features built up over billions of years. To destroy these features is to reduce the options available to present and future generations. Nature Reserves protect this natural heritage.

Finally, and perhaps most importantly, Nature Reserves help us to see ourselves in perspective. They preserve evidence of a grand process which preceded man and will follow him, which has affected his history and will dictate his destiny.

How Are Nature Reserves Selected?

15 The continuing action of wind and water erodes, transports and deposits the earth's surface materials.

16 A great variety of bedrock types and patterns can be found in Ontario, such as this interesting exposure at Neys Provincial Park.

An area is recommended as a prospective Nature Reserve only if it meets certain criteria for representing our natural history.

Earth Science Representation
The purpose of earth science representation is to protect examples of the full range of features which illustrate Ontario's earth science history.

Earth science features are the physical elements of the natural landscape, created by the earth's processes and distinguished by composition, structure and shape. These features include rock and fossil units and landforms (Figures 1 and 2).

Earth science features can be organized according to the time of their formation (Figure 3). They can also be organized into distinctive environments on the basis of location, natural processes and time. Through the identification and organization of these features and environments, the earth science history of Ontario can be traced. Based on these principles, an outline of Ontario's earth science features and environments has been prepared to guide the selection of Nature Reserves.

Many earth science features are resistant to change, whether due to natural processes or as a result of man's activities. Some, however, are susceptible to such changes. Nature Reserves are intended to minimize changes caused by man, especially where features are rare.

Nature Reserves are selected also to represent earth science environments. The number of areas required to display adequately the rocks, fossils and landforms of an earth science environment is determined by the geographic distribution of the features.

Life Science Representation
The purpose of life science representation is to protect examples of the full range of environmental conditions and plants and animals indigenous to Ontario.

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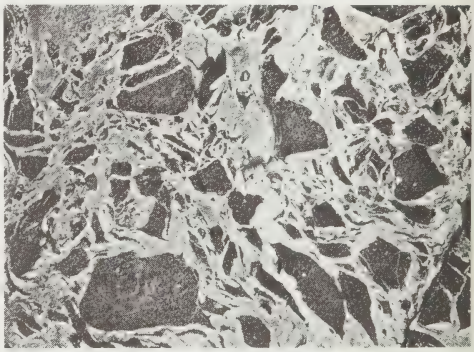

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Life science representation requires identification of the ecosystems, plants and animals that comprise the natural diversity of the Province. Both terrestrial (land) and aquatic (water) environments must be included to represent the entire range of conditions and life. To date, most progress has been made on the classification and identification of terrestrial ecosystems. Further work on the organization and selection of aquatic environments, an essential component of ecosystem representation, is needed.

Climate, soil moisture and nutrients are important factors that affect the distribution and development

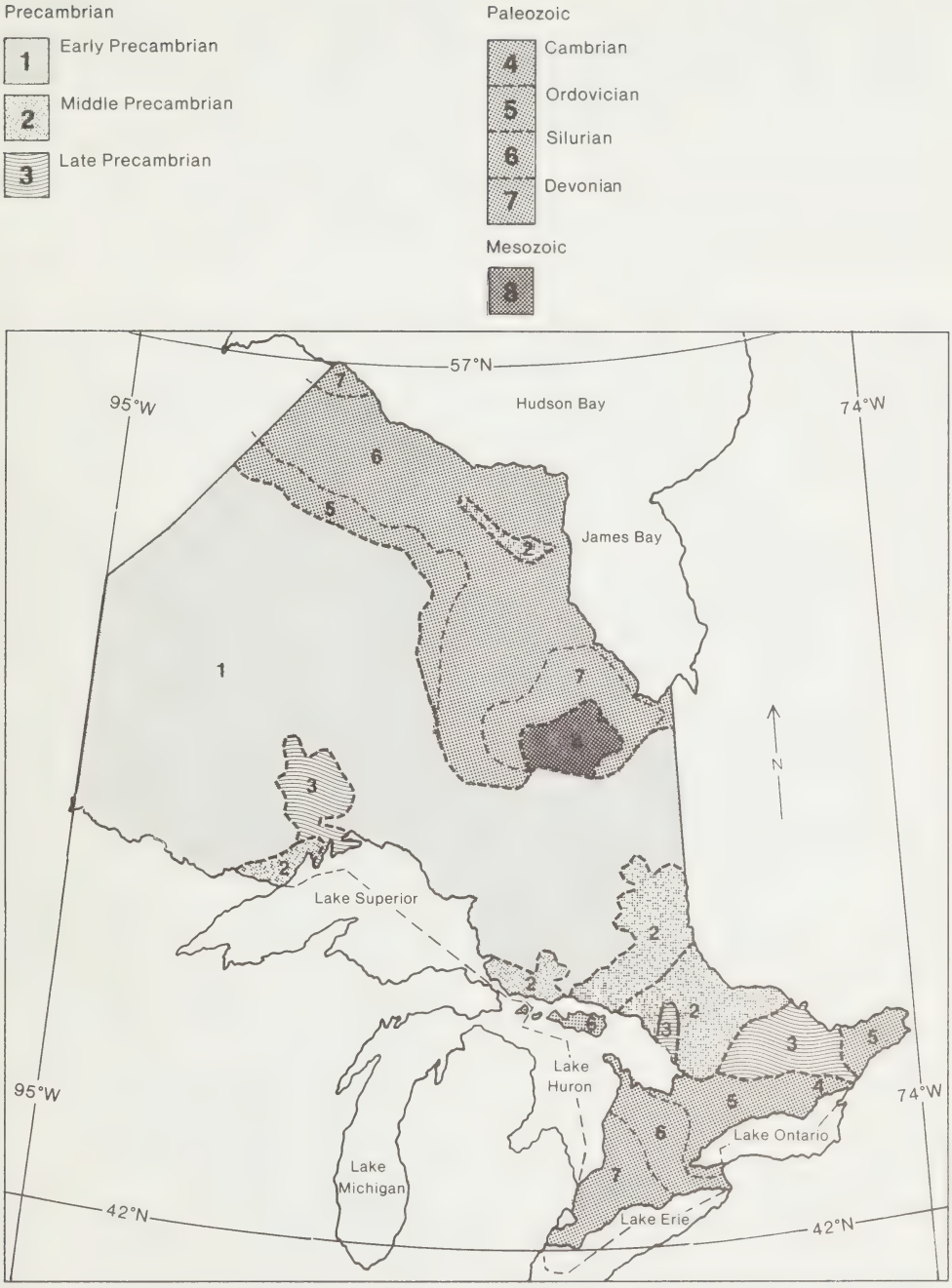

Figure 1. Generalized Bedrock Geology of Ontario (Modified after Ayres and others, 1971).

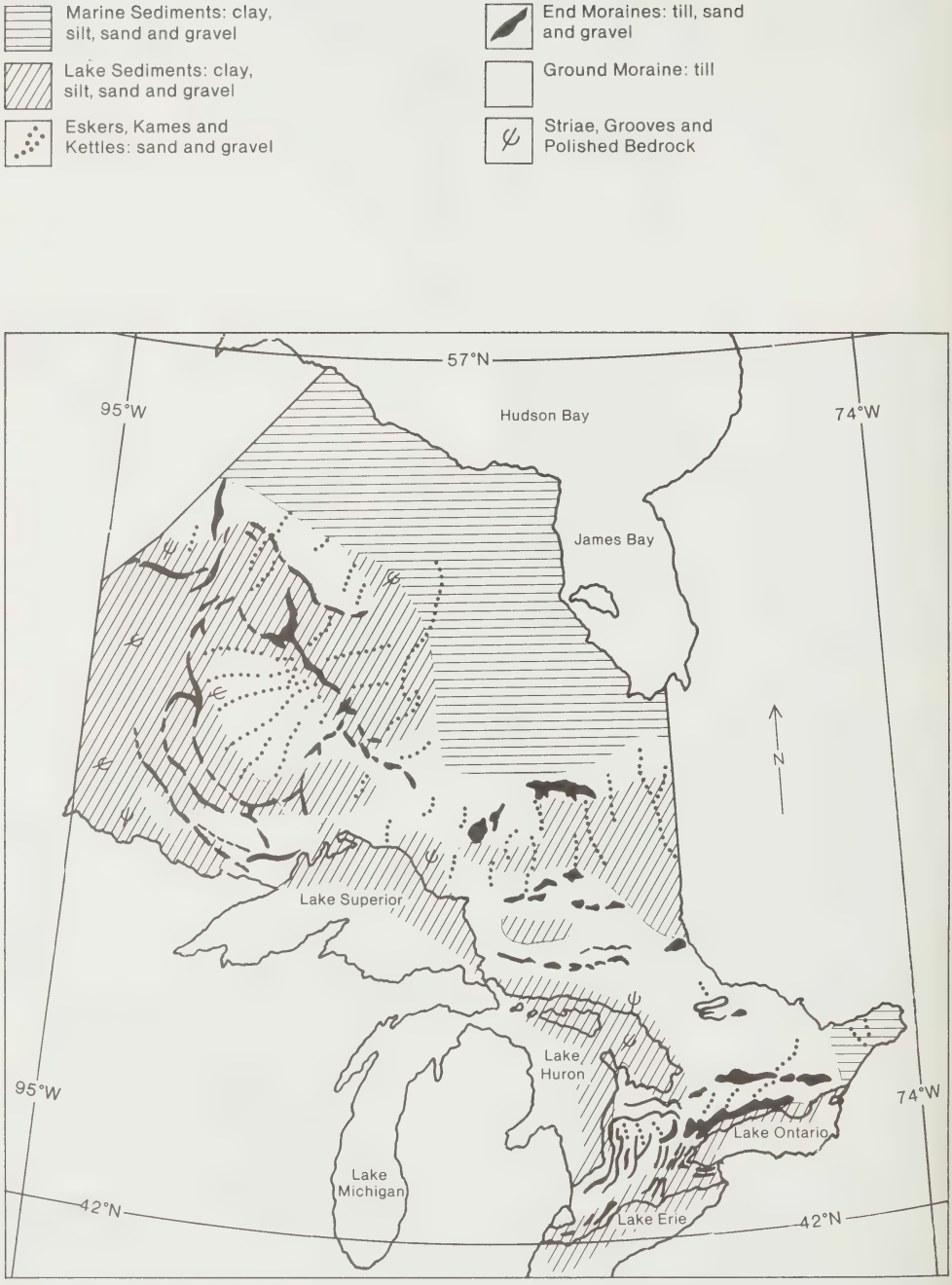

Figure 2. Generalized Surficial Geology of Ontario (Modified after Prest and others, 1968).

Time Stratigraphy						
Eonothem	Erathem	System	Series	Stage	Major Events in the Evolution of North America	(millions of years ago)
					Man-dominated Environments	
			Holocene		Period of Modern Geologic Processes	
						.008
						.009
		Quarternary				.0105
	Cenozoic					.011
						.012
						.013
						.014
			Pleistocene	Wisconsin	Period of Continental Glaciation	.016
						.024
Phanerozoic						.029
						.033
						.042
						.047
						.067
						.070
				Sangamonian	Evolution of Mammals and Man	
				Illinoian	Laramide Mountains	
		Tertiary	No Record in Ontario		Evolution of Reptiles, Birds and Gymnosperms Period of Continental Uplift	
	Mesozoic	Cretaceous		Lower	Evolution of Dinosaurs	
		Jurassic	No Record in Ontario		Appalachian Mountains	
		Triassic				
	Paleozoic	Permian			Evolution of Amphibians and Lycopods	
		Carboniferous			Acadian Mountains	360
		Devonian	Upper		Evolution of Vertebrates	380
			Middle			
			Lower			
		Silurian	Upper		Evolution of Advanced Invertebrates	410
			Middle			
			Lower		Taconic Mountains	430
		Ordovician	Upper			460
			Middle		Period of Marine Seas	480
			Lower			
		Cambrian	Upper			
			Middle		Evolution of Primitive Invertebrates	751
			Lower			
Precambrian	Late to Middle Precambrian	Hadrynian	No Record in Ontario		Grenville Mountains	935
		Helikian	Neohelikian		Elsonian Mountains	1390
			Paleohelikian		Hudsonian Mountains	1720
		Aphebian	Upper			1925
			Middle		Evolution of Primitive Life	2150
			Lower		Kenoran Mountains	2485
	Early Precambrian	Late Archean			Period of Tectonic Activity	2900
		Early Archean			Primitive Earth	

Figure 3. Generalized Geological Time Scale.

17 Wet deciduous forests of extreme southern Ontario are among the most diverse and luxuriant biotic communities in Canada. The Canadian distribution of many southern plants and animals coincides with the patchwork of woodlots that remain in Ontario's extreme south.

17

of ecosystems. Vegetation, being the most visible part of terrestrial ecosystems, is a good indicator of environmental conditions, and is a major component of wildlife habitat. In addition, landform is an indicator of ecological conditions since it affects the availability of the physical requirements essential for vegetation development.

Forest, wetlands and other vegetation types can be organized on the basis of broad environmental conditions found in each of eight natural regions of Ontario (Figures 4 and 5). This approach guides the selection of representative ecosystem features for Nature Reserves.

In practice, areas that contain the most complete range of environments and vegetation types characteristic of natural regions are selected for Nature Reserves. Through systematic search, fine examples of the different forest types, shrublands, grasslands and other ecosystems will be protected in the system. A premium is placed on undisturbed areas which include unique and characteristic vegetation and landform patterns for each natural region. Thus the representation of distinctive landscapes and plant and animal habitats throughout Ontario can be achieved.

In addition, special effort is directed to the identi-

Figure 4. The Natural Vegetation Regions of Ontario (Maycock, in preparation).

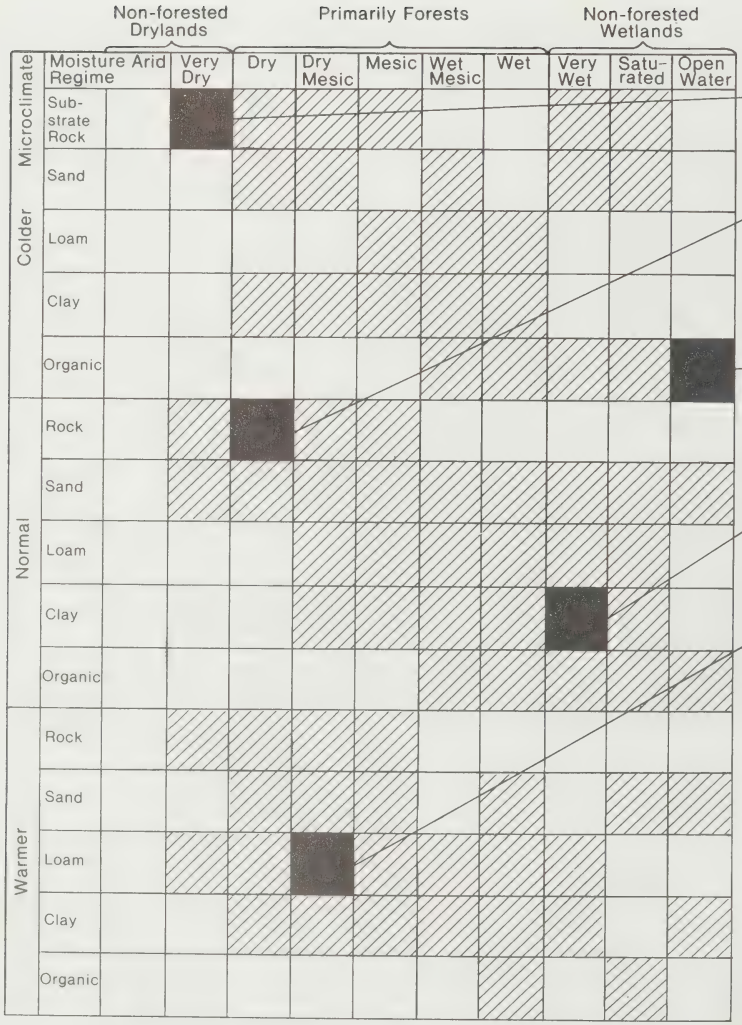

Figure 5. Sample Vegetation Format for the Southern Deciduous-Evergreen Forest Region. Hatched areas represent environments for which vegetation types have been reported. Insets above illustrate biotic communities reported for the environments shaded in the diagram (Maycock, in preparation

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18 The distribution of plants and animals is intimately linked with landform features, such as here at the Sleeping Giant in Sibley Provincial Park.

19 The assessment of Nature Reserves involves the collection of field data to assist in the evaluation of the Reserve's features.

fication of critical habitats supporting plants and animals that are unique, rare or threatened with extinction, or that have their limits of distribution in Ontario.

Nature Reserve Identification and Evaluation

Prospective Nature Reserves are identified through theme studies, systematic geographic examination and discussions with naturalists, scientists and government personnel.

Theme studies are completed to locate representative examples of particular environments for Nature Reserves. An open file of prospective areas has been assembled on the basis of such studies, which might, for example, concentrate on locating examples of glacial beach sites in Ontario.

Geographic studies concentrate on examining natural regions or areas important to government planning. Thus, prospective Nature Reserves were identified along the Niagara Escarpment in connection with the work of the Niagara Escarpment Commission.

Ministry staff, naturalist clubs and private citizens also draw attention to important areas. Most of the present Nature Reserves, in fact, owe their existence to these sources.

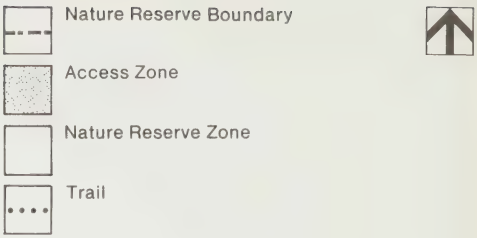
Once an area is proposed as a Nature Reserve, an assessment of its natural history is carried out. The quality and integrity of the features and their suitability to represent natural history themes are evaluated. The assessment of candidate Nature Reserves also considers boundary location so that any negative influences of surrounding land uses can be mimimized.

Areas that have not been disturbed by man are preferred for Nature Reserves. Exceptions are made when prior modification by man has enhanced the scientific and educational interest of natural features. Priority is also given to areas where features are threatened by deterioration or destruction.

Prospective areas are evaluated to determine how their use as Nature Reserves would affect economic activities and other potential land uses.

The Minister of Natural Resources must approve all Nature Reserve designations. Any private lands involved in the proposal are purchased or otherwise obtained by the Crown, and then a formal regulation under *The Provincial Parks Act* establishing the Reserve as a Provincial Park is approved by the Lieutenant-Governor in Council.

How Are Nature Reserves Managed?



A master plan, based on an inventory and evaluation of natural resources, is prepared for each Nature Reserve. The plan establishes detailed policy guidelines for the long-term protection, development, and management of each Reserve.

The master plan zones lands and waters within the Reserve into one or more of the following categories:

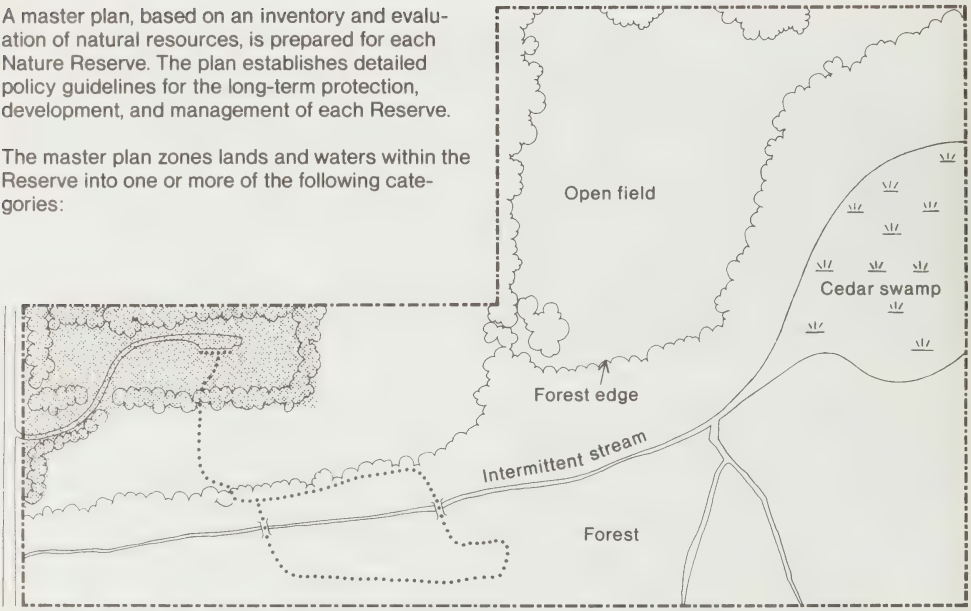


Figure 6. Example of Zoning from Peter's Woods Nature Reserve.

1) Nature Reserve Zones:
These zones constitute most of the area of individual Reserves and include the significant earth and life science features.

2) Access Zones:
These zones are small staging areas for basic facilities, such as parking lots, which support the use of Nature Reserve Zones. There is normally only one such zone in each Reserve.

3) Historical Zones:
If a Nature Reserve should contain any sites of archaeological or historical importance, Historical Zones may be designated. Such zones allow for management distinct from that in adjacent zones.

The following paragraphs summarize the management policies for Nature Reserves. These policies are detailed in the manual *Ontario Provincial Parks: Planning and Management Policies* (1978) which may be consulted at any office of the Ministry of Natural Resources.

Development within Nature Reserves and Nature Reserve Zones will be the minimum necessary to permit public appreciation and scientific research. In Nature Reserve and Historical Zones, development is limited to trails, modest interpretive displays, and research facilities. In Access Zones, roads, parking lots, picnic tables, interpretive and research stations may be developed to a modest degree. Camping is not permitted, except where educational and scientific interest may justify the development of small camping areas for the use of appropriate groups.

20 In some cases, Nature Reserves require active management to maintain a particular feature. One example of a management technique applied to maintain a particular community is the controlled burning of prairie at Ojibway Prairie Nature Reserve.

anagement is concerned above all with the otection of natural heritage features. In some ses, this may mean no action or passive anagement. In other cases, careful control may required to maintain natural features and nditions in a desirable evolutionary stage.

e commercial exploitation of timber, minerals, h, and game in Provincial Nature Reserves is not rmitted, nor are sport hunting and fishing.

here non-native plant and animal species have come established, they may be eradicated, but e never deliberately introduced. Native plant and imal species now missing from a Reserve but own to be present historically may be re-tablished.

es, diseases and infestation by native forest ects are part of nature and are usually allowed to n their course. However, they may be suppressed uman life, park facilities, or property outside the serve are endangered.

ovincial Nature Reserves and Nature Reserve nes are available for public appreciation, but are t intended to be picnic, swimming, or camping es with incidental natural heritage values. cordingly, recreational opportunities are limited. tor vehicles and motorboats are not permitted hin Reserves. If overuse threatens the natural heritage, use restrictions or quotas may be established.

Scientific research is encouraged; however, research programs must be approved by the Minister of Natural Resources. Persons interested in conducting research in Provincial Nature Reserves or Nature Reserve Zones in other parks should contact the District Manager of the administrative district in which the Reserve is located.

Do Nature Reserves Alone Protect Our Natural Heritage?

21 Wilderness parks in Ontario protect large, undisturbed landscapes and help protect Ontario's natural history.

As of January 1980, twelve Provincial Nature Reserves occupying 1 559 hectares have been designated within Ontario. Obviously these few Reserves cannot represent fully our natural heritage. Although work is progressing to designate additional Nature Reserves, there are other complementary Provincial Parks and park zones that contribute to the protection of natural diversity.

In addition to being the prominent zones in Nature Reserves, Nature Reserve Zones may also be established in other Provincial Park classes. The criteria for selection are the same as for Provincial Nature Reserves, and long-term protection is formulated in master plans. There are presently 132 Nature Reserve Zones, totaling approximately 270,000 hectares, that have been established in Provincial Parks with master plans.

Wilderness Zones also contribute to the protection of our natural heritage since they are substantial areas where the forces of nature are permitted to function freely. Wilderness Zones are the principal component of Wilderness Parks, and may also be designated in large Provincial Parks of other classes. These zones are managed to protect the natural features within from exploitation and development, while allowing visitors to travel by non-mechanized means.

Other agencies play a complementary role in protecting Ontario's natural heritage. Canada's National Parks, some of which are located in Ontario, and parks of the Niagara, St. Lawrence, and St. Clair Commissions also help to protect natural diversity.

Areas managed by Ontario's Conservation Authorities offer various levels of protection to some important natural features. While municipal parks are meant for high-intensity recreation, some provide protection for natural areas.

Certain other agencies and groups have been instrumental in protecting natural areas from development or destruction. The Federation of Ontario Naturalists, the Ontario Heritage Foundation, and various universities and nature clubs own lands with important natural features. The Nature Conservancy of Canada and the Canadian National Sportsmen's Show have made particularly laudable contributions by raising funds to assist public agencies to acquire lands for nature protection.

Also noteworthy is the role played by private landowners who have protected natural features on their properties by foregoing opportunities to sell or develop. Some individuals have made lasting gifts to Ontario's citizens by donating land to the Provincial Government, or to the Nature Conservancy of Canada, for management as Nature Reserves. Incidentally, the possibility of substantial tax benefits provides an incentive for donating land.

Nature Reserves are the cornerstone of the government's attempt to protect examples of Ontario's diverse natural heritage. This task cannot be accomplished by Nature Reserves alone without the work of individuals, agencies and organizations to protect wilderness, open space and natural areas. Such efforts will help to ensure that the environment remains a fit home for man and other life forms.

Visiting Nature Reserves

Visitors are reminded that it is unlawful to remove anything from Nature Reserves. Organized groups wishing to visit these areas should contact the nearest Ministry of Natural Resources office for information about access and interpretive assistance.

For more information about Ontario Provincial Parks, contact:

Parks Information,
Room 3304,
Whitney Block,
Queen's Park,
Toronto, Ontario,
M7A 1W3

(416) 965-3081

Figure 7. Provincial Nature Reserves in Ontario.

Further Reading

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Notes

Descriptions of Provincial Nature Reserves

1 Gibson River
2 Matawatchan
3 Montreal River
4 Porphyry Island
5 Trillium Woods
6 Waubashene Beaches
7 Ouimet Canyon
8 Cavern Lake
9 East Sister Island
10 Peter's Woods
11 Ojibway Prairie
12 Schreiber Channel

5303/1981

CHANGES AND CORRECTIONS

Booklet

Pg. 4, caption 9 should read: The yellow fringed orchid (*Platanthera ciliaris*), a showy wildflower that was reported to occur in southwestern Ontario after settlement, may no longer survive in the province.

Pg. 7, right column, line 6: most should read much

Pg. 18, left column, line 15: totaling should read totalling

Back cover flap: Waubashene should read Waubaushene

Leaflets

Gibson River #1

Pg. 2, natural features map:

The northern boundary of the park extends to Gibson River.

The open woodlands lying within the mapped boundary of paragneiss outcrops are underlain by this rock type and should be coded accordingly. The open woodlands lying within the mapped boundary of quartz monzonite outcrops are underlain by this rock type and should be coded accordingly.

Montreal River #3

Pg. 4, Administration section should read:

District Manager, Sault Ste. Marie District
Ontario Ministry of Natural Resources
69 Church St., Box 130
Sault Ste. Marie, Ontario P6A 5L5

Ouimet Canyon #7

Pg. 2, natural features map: The narrow road corridor is incorrectly colour-coded blue.

Cavern Lake #8

Pg. 4, left column, line 33: behavior should read behaviour

Peter's Woods #10

Pg. 1, left column, line 5: between should read among

Gibson River Provincial Nature Reserve

1

General Information

Gibson River Provincial Nature Reserve was initially designated under *The Wilderness Areas Act* to protect a stand of mixed deciduous forest considered to be representative of the Muskoka region. Prior to designation the Wilderness Area was Crown land. In 1970, the Area was placed into regulations under *The Provincial Parks Act*. The size of the Nature Reserve is about 168 hectares (415 acres).

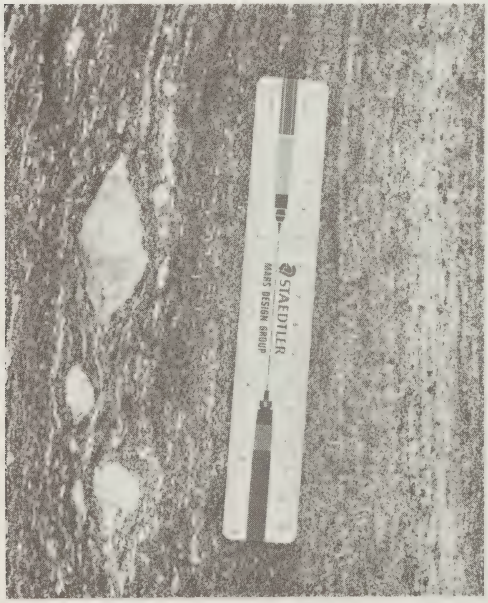
Natural History

Earth Sciences

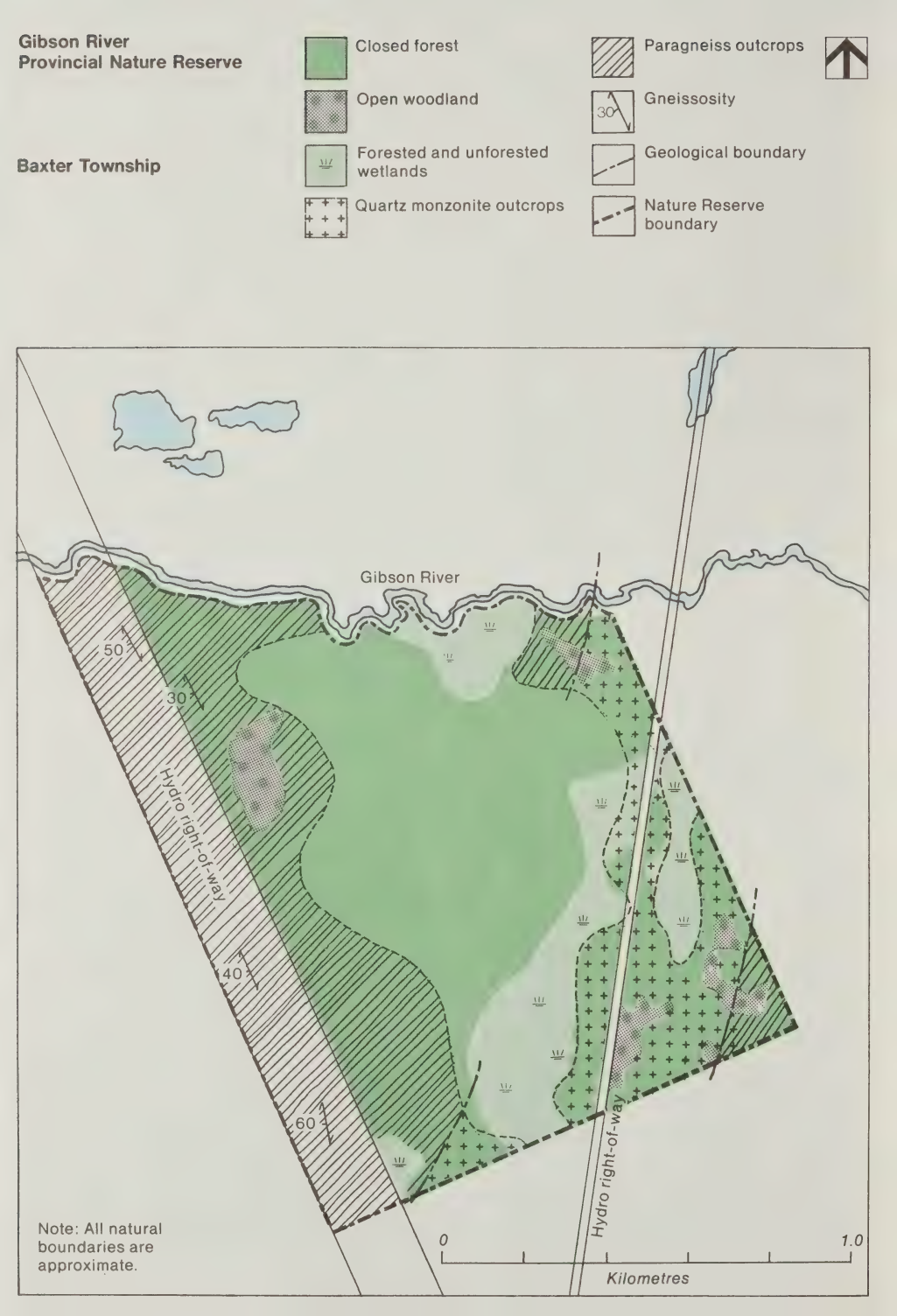
Gibson River Provincial Nature Reserve is located in the Grenville section of the Canadian Shield. The Grenville section or province includes the Ontario Gneiss Belt and the Central Metasedimentary Belt. The bedrock in the Nature Reserve is characteristic of the Ontario Gneiss Belt.

Bedrock is exposed as cliffs along the banks of the Gibson River and uplands in the western and southern portions of the Nature Reserve. These rocks were deposited into an Archean sea as ancient sediments over 2.5 billion years ago. These sediments were subsequently changed by heat and pressure into paragneiss during the formation of the Huronian mountains, once located to the north and since eroded away.

The paragneiss found in the Nature Reserve is composed dominantly of biotite, feldspar and quartz with numerous inclusions of small garnet crystals.



The paragneiss has numerous textures including: the lineation and banding of minerals, the inclusion of coarse crystals called 'eyes', folding and faulting. These forms may be observed in outcrops in the western portion of the Nature Reserve.


Gibson River
Provincial Nature Reserve
Baxter Township
Closed forest
Open woodland
Forested and unforested wetlands
Quartz monzonite outcrops
Paragneiss outcrops
30
Gneissosity
Geological boundary
Nature Reserve boundary
Gibson River
50
30
Hydro right-of-way
140
60
Hydro right-of-way
Note: All natural boundaries are approximate.
0
1.0
Kilometres

Closed deciduous forest of sugar maple (*Acer saccharum*) and wetlands in the northern section of the Nature Reserve.

The paragneiss has been intruded by granitic veins composed of coarse grained quartz, feldspar, biotite and hornblende. Quartz monzonite, an igneous intrusive rock, may also be observed in the Nature Reserve.

Its surface has been subjected to millions of years of erosion. In the last million years numerous glaciers gouged, scratched and polished the surface of the rocks. Boulders called "erratics" are scattered throughout the Nature Reserve and are thought to have been deposited by glacial ice or by floating icebergs in glacial lake Algonquin. Recently, the actions of frost and plants have become the dominant land forming processes.

Life Sciences

The Nature Reserve lies in a mixed forest region where rolling granitic rocklands with stunted open forests and numerous bedrock exposures are juxtaposed with low-lying areas that contain more productive closed forests and wetlands.

This regional vegetation pattern is represented in part by the Nature Reserve, most of which is low-lying. On comparatively deep mineral soils a deciduous forest of sugar maple (*Acer saccharum*) with basswood (*Tilia americana*), yellow birch (*Betula lutea*) and beech (*Fagus grandifolia*) predominates. This forest merges into a much younger woodland of sugar maple, trembling aspen (*Populus tremuloides*) and white birch (*Betula papyrifera*). With increasing soil moisture, immature forests of balsam fir (*Abies balsamea*) and white birch with scattered hemlock (*Tsuga canadensis*) occur. Deciduous-coniferous woods of maturing white pine (*Pinus strobus*) and largetooth aspen (*Populus grandidentata*) with young sugar maple and red maple (*Acer rubrum*) mark a transition from rock outcrop to mineral soils. Rock outcrops with moss-lichen cover dot the area, with concentrations in the northwest, northeast and southeast sections. On these outcrops, pockets of thin, very dry mineral soils support open stands of white pine and red oak (*Quercus rubra*).

Yellow birch and hemlock swamps and lowland thickets of slippery alder (*Alnus rugosa*) on deep organic soils form the major wetland system. Along the meandering course of Gibson River, marshes and thickets have developed in response to fluctuating water levels.

Included within the rich, sugar maple woods is a moderately large stand (about 40 hectares or 100 acres) of undisturbed mature forest. This woodland provides habitat for the rare western grass *Melica smithii*. In addition, the eastern massasauga rattlesnake (*Sistrurus catenatus catenatus*), an endangered species, has been observed along the Gibson River.

Management

Protective management has been minimal because of the relative inaccessibility of the Nature Reserve.

The unauthorized collection of plants, animals or geological specimens is prohibited under *The Provincial Parks Act.*

Anyone wishing to conduct natural history research in the Nature Reserve must obtain approval through the District Manager.

Further Reading

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Administration

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Floating aquatic vegetation, lowland thickets and shoreline forests in the southern portion of the Nature Reserve.

Ontario Ministry of Natural Resources
Hon. James A.C. Auld, Minister
W.T. Foster, Deputy Minister

This leaflet is one of a series from the publication: Parks and Recreational Areas Branch. 1981. *Provincial Nature Reserves in Ontario.* Ministry of Natural Resources, Toronto.

Matawatchan Provincial Nature Reserve

2

General Information

The Crown land base of this Nature Reserve was initially designated under *The Wilderness Areas Act* to protect a tract of forest considered representative of the Madawaska Valley. In 1970 the area was placed into regulations under *The Provincial Parks Act.* The size of the Nature Reserve is about 65 hectares (160 acres).

Natural History

Earth Sciences
The Nature Reserve is situated in the Grenville section of the Canadian Shield. The Grenville section or province includes the Ontario Gneiss Belt and the Central Metasedimentary Belt. The bedrock of the Nature Reserve is characteristic of the Central Metasedimentary Belt.

Three types of bedrock—paragneiss, marble and granite—are found in the Nature Reserve. The paragneiss and the marble were originally deposited as greywacke and limestone sediments within an ancient Precambrian sea. These rocks in turn were metamorphosed or changed by pressures from within the earth's crust.

The paragneiss, which consists of biotite gneiss and quartzite, is exposed in the east, and the marble is exposed in the west. The granite exposed in the middle of the Nature Reserve is younger than the adjacent metasediments, being an igneous rock that was intruded into the host metasediments.

Shoreline vegetation and upland forest adjacent to Hutson Lake.


Matawatchan
Provincial Nature Reserve
Matawatchan Township
Closed forest
Forest clearing
Unforested wetland
Granite gneiss outcrops
Marble outcrops
Paragneiss outcrops
Geological boundary
Nature Reserve
bounday
Hutson Lake
0
1.0
Kilometres
Note: All natural
boundaries are
approximate.

Walking fern (*Camptosorus rhizophyllus*) is named after its habit of vegetative reproduction whereby tips of the fronds in contact with a rooting substrate produce new plants.

The bedrock has been covered by vast seas and marine sediments in the Paleozoic. These sediments were removed by erosion in the late Paleozoic and Mesozoic. The Nature Reserve has been subjected to thrusting and down faulting as part of the Ottawa-Bonnechere graben or rift valley in the Mesozoic. Glaciers scoured the area in the Cenozoic.

Life Sciences

The Nature Reserve lies in a large region noted for its transitional deciduous-evergreen forest. The terrain has marked variations in relief, soil conditions and local climate. Mineral soils predominate in valleys while bedrock outcrops are confined primarily to hilltops.

The Nature Reserve's small size limits the variety of biotic communities. Except for a small clearing west of Hutson Lake, closed forest dominates. This forest contains a mixture of sugar maple (*Acer saccharum*), hemlock (*Tsuga canadensis*), yellow birch (*Betula lutea*), beech (*Fagus grandifolia*) and other trees. Small stands of large hemlock occupy the shoreline of Hutson Lake. The small valley entering the lake supports large American elm (*Ulmus americana*) and red maple (*Acer rubrum*). Red spruce (*Picea rubens*), which approaches its western range limit here, also occurs along the valley. The lowland forests contain concentrations of white cedar (*Thuja occidentalis*) and balsam fir (*Abies balsamea*). Wetlands on the lakeshore include small meadows, marshes and thickets.

The marble outcrops in the western portion of the Nature Reserve are of special botanical interest as they support walking fern (*Camptosorus rhizophyllus*) as well as several other plants that require calcium in quantity.

Management

Few people visit Matawatchan Nature Reserve because of its inaccessibility.

The unauthorized collection of plants, animals or geological specimens from the Nature Reserve is a violation of *The Provincial Parks Act.*

Those wishing to conduct research in the Nature Reserve require the approval of the District Manager.

Further Reading

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Satterly, J. 1944. Mineral Occurrences in the Renfrew Area; Ontario Department Mines, Annual Report, Vol. 53, pt. 3. Accompanied by Colour Map 53B.

Administration

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PEMBROKE, Ontario K8A 6X4

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Shoreline and inlet on Hutson Lake in the southeastern portion of the Nature Reserve.

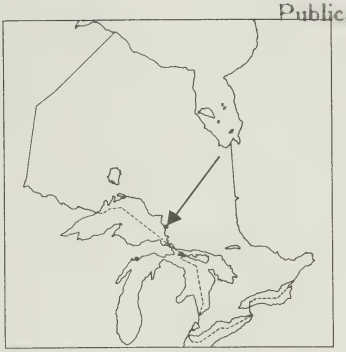
Ministry of Natural Resources
Ontario

Hon. James A.C. Auld
Minister

W.T. Foster
Deputy Minister

This leaflet is one of a series from the publication: Parks and Recreational Areas Branch. 1981. *Provincial Nature Reserves in Ontario.* Ministry of Natural Resources, Toronto.

Montreal River Provincial Nature Reserve



3

General Information

The Crown land base of this Nature Reserve was initially designated under *The Wilderness Areas Act.* In 1970, the area was placed into regulations under *The Provincial Parks Act.* The size of the Nature Reserve is about 44 hectares (108 acres).

Natural History

Earth Sciences

Montreal River Provincial Nature Reserve is underlain by early Precambrian granite. This rock was formed as a massive intrusion of molten material into older sediments and volcanics. In the southern corner, the granite in turn contains a linear diabase dike, also an intrusion (Nuffield, 1955).

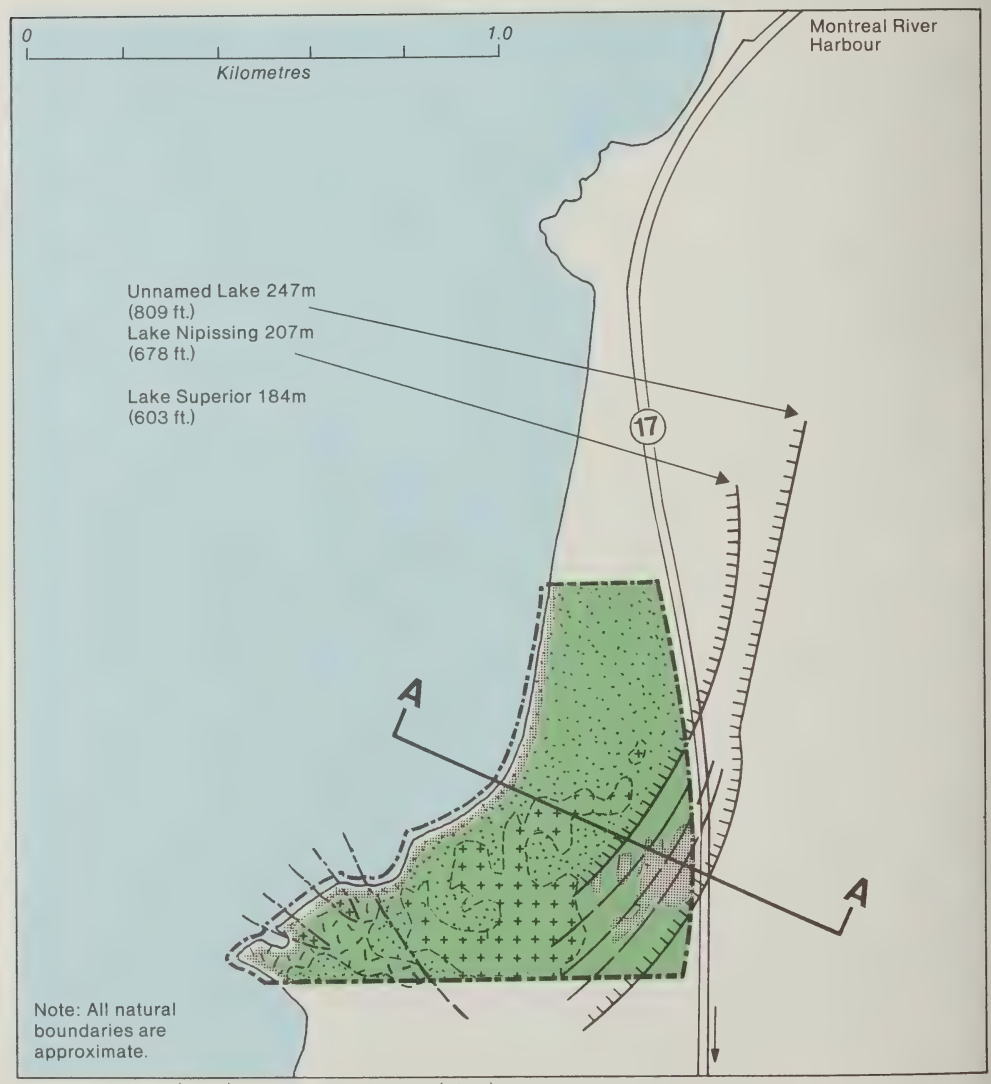
The landscape of the Nature Reserve is dominated by coastal features. The present Lake Superior coastline, at 184 metres (603 feet) above sea level (a.s.l.), consists of wave washed outcrops of granite and diabase. Inland, there is a steep bluff, the base of which is 207 metres (678 feet) a.s.l. The bluff and offshore sand are derived from the Nipissing stage of the Great Lakes. Coastal processes were active at this level approximately 6,000 years ago.

At the top of the Nipissing bluff, an impressive array of raised cobble beaches or bars occurs. These bars can be traced inland, beyond Highway 17, to another shore bluff at 247 metres (809 feet) a.s.l., and also to the southwest, where they are truncated abruptly by rocky cliffs of granite and

Raised offshore cobble bars support lichen barrens which merge with adjacent forests.

Montreal River Provincial Nature Reserve

District of Algoma



Sources: Nuffield (1955) and Tovell and Deane (1966)

Mats of bearberry (*Arctostaphylos uva-ursi*) invade cobble bars where reindeer mosses (*Cladinae* spp.) dominate.

diabase. This lake stage remains unnamed.

The raised cobble bars created during this unnamed stage were apparently the result of a ridge and swale pattern formed in an offshore environment. They developed in response to the rhythmic actions of waves on the coast, a common occurrence in coastal environments. Such bars are most commonly found in sand, but at the Nature Reserve, the bars are constructed of cobbles and boulders. Scientists indicate that this is an unusual situation (Tovell and Deane, 1966).

Life Sciences

The Nature Reserve represents some of the habitats and biotic communities characteristic of the Lake Superior region.

The southwestern portion of the Reserve includes sloping terrain with forests of jack pine (*Pinus banksiana*) and spruces (*Picea* spp.), as well as several gullies with mixed forest types that occur commonly in the coastal region. The southeastern corner just touches upon the sugar maple (*Acer saccharum*) and deciduous-evergreen forests that characterize the hilltops in the coastal region as far north as Wawa. On the Nipissing sand plain there are successional forests of pines (*Pinus* spp.), birches (*Betula* spp.) and spruces.

Habitats on the contemporary shoreline include rugged rock headlands in the south and sand and cobble beaches in the north. Lichens, mosses and hardy flowering plants live in these coastal habitats. No subarctic plants for which the Lake Superior shoreline is noted have been reported here.

It is thought that extensive lichen barrens on the raised cobble bars are the biotic communities of greatest significance. Mats of bearberry (*Arctostaphylos uva-ursi*) and groves of pines and birches occur in some places on the barrens. Intermediate-aged mixed forests surround the barrens on all sides except adjacent to Highway 17. Although the lichen barrens are of certain scientific interest, no comprehensive ecological study of these and similar communities in the Lake Superior basin has been undertaken.

Management

Of the natural features represented at the Nature Reserve, the lichen barrens are without doubt the most sensitive. Ease of access magnifies problems associated with management. The lichen growth is particularly sensitive to erosion by pedestrian traffic under all conditions, so visitors should refrain from walking on the lichen barrens.

The unauthorized collection of plants, animals and geological specimens is prohibited under *The Provincial Parks Act.*

Those wishing to conduct research in the Nature Reserve are required to obtain the approval of the District Manager.

Further Reading

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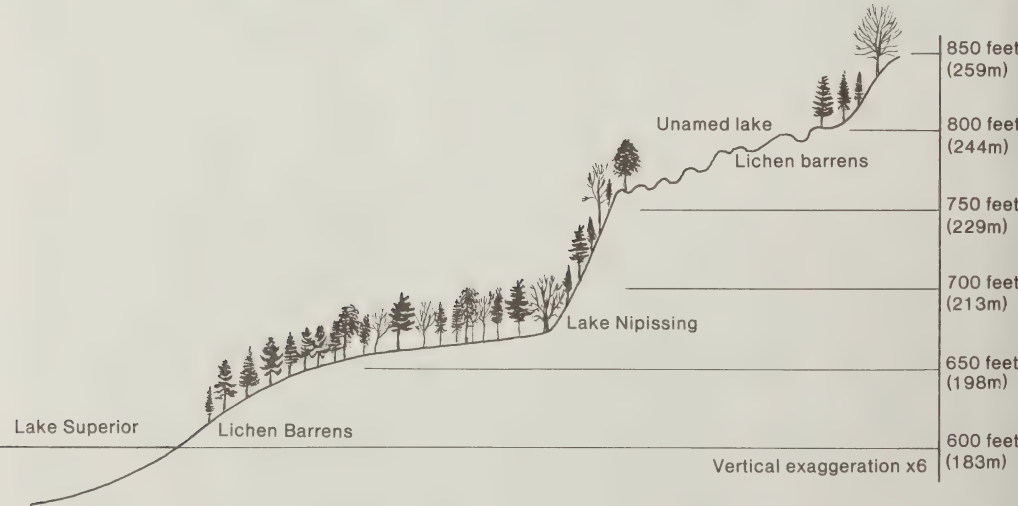
Administration

District Manager, Wawa District,
Ontario Ministry of Natural Resources,
22 Mission Road, Box 1160.
WAWA, Ontario. P0S 1K0

Telephone: (705) 856-2396



Generalized cross-section (A-A, see map) of raised shorelines and associated vegetation (Modified after Tovell and Deane, 1966).

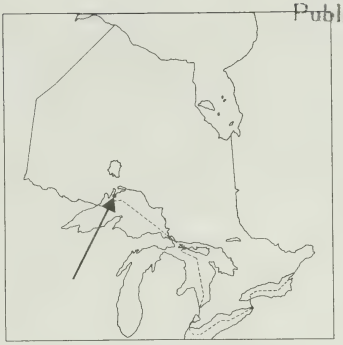
Ministry of Natural Resources
Ontario

Hon. James A.C. Auld
Minister

W.T. Foster
Deputy Minister

This leaflet is one of a series from the publication: Parks and Recreational Areas Branch. 1981. *Provincial Nature Reserves in Ontario.* Ministry of Natural Resources, Toronto.

Porphyry Island Provincial Nature Reserve



4

General Information

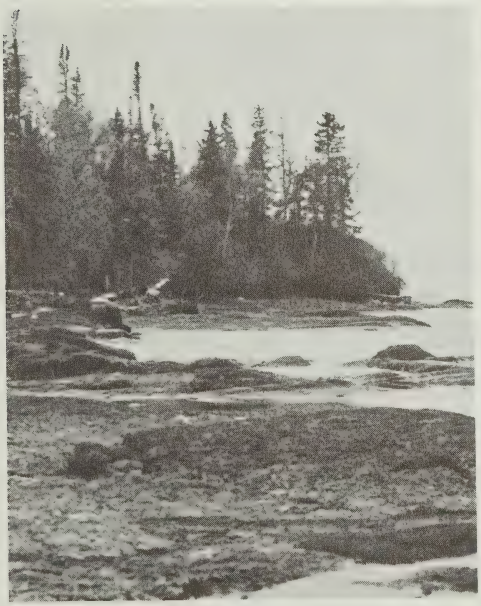
The land base of this Nature Reserve was initially designated under *The Wilderness Areas Act.* The area was subsequently placed into regulations under *The Provincial Parks Act* as a Provincial Nature Reserve in 1970. The size of the Reserve is about 107 hectares (264 acres).

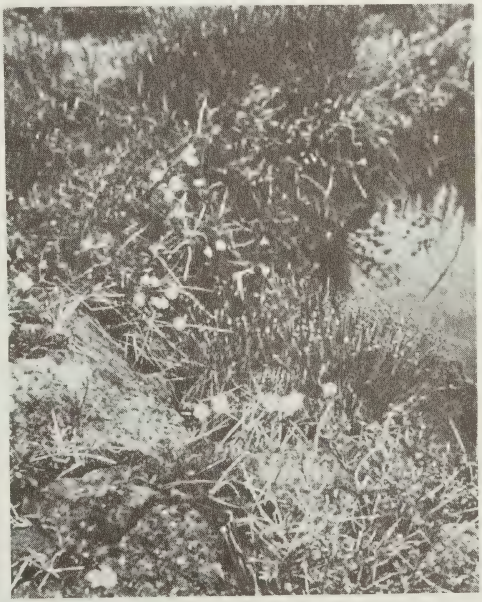
Natural History

Earth Sciences
Porphyry Island is the last island of a chain stretching southwest from the Black Bay Peninsula. It is generally flat to rolling with little relief, and the rugged shoreline offers few sheltered areas.

The bedrock of the Black Bay Peninsula and Porphyry Island is of Late Precambrian age and consists of over 300 volcanic lava flows. These volcanic rocks are typically grey-green basalt and in their entirety constitute the Osler Group.

A typical lava flow is 3-12 metres (10-40 feet) thick. The basal portion of the flow has an amygdaloidal texture which results from the filling of gas cavities by secondary minerals. The central portion is formed of massive basalt, while the upper portion or the flow tops are characteristically brown to red because they were oxidized immediately after the flows were deposited. Minor amounts of sedimentary rocks are associated with the Osler Group (McIlwaine and Wallace, 1976).





Barren bedrock shorelines, left, support showy flowering herbs and sedge tussocks, right.

Porphyry Island Provincial Nature Reserve

District of Thunder Bay

Source: McIlwaine and Wallace (1976)

Scientific collection of devil's club (*Oplopanax horridus*) (Herbarium, University of Toronto, Accession No. 178987,D.R. Given and J.H. Soper, Collection No. 73265).

Live specimen illustrating new growth, thorny stem and dead flowerhead from the previous growing season.

The Island and the Nature Reserve take their name from the characteristic quartz and feldspar crystals found within the volcanic rocks of the Osler Group. Rock exhibiting this type of texture is called porphyry.

The volcanic flows are crosscut by younger diabase and basalt dikes that have been subdivided into older, wide, and younger, narrow, northeast trending dikes. The former are resistant to erosion and form topographic highs, while the latter are susceptible to erosion and form topographic lows. Both types are present in the Nature Reserve.

The island's morphology is controlled by the surface expression of the bedrock. Soils are thin and consist of silty and sandy material. The shoreline is dominated by wave-washed outcrops and cobble beaches.

The Thunder Bay-Sibley-Black Bay area in general and the Nature Reserve in particular have long been of interest to the prospector. As far back as 1846, silver, copper and Iceland spar were reported (Tanton, 1931). Despite these reports and much exploration, no deposits of economical value have been found in the Reserve.

Life Sciences

Porphyry Island is located on the southern margin of the Boreal Forest, a vast region up to several hundred kilometres wide extending in Canada from the Yukon to Newfoundland.

The ecological conditions on the island are a product of the climatic influence of Lake Superior combined with the local soil conditions and topography. Throughout the interior of the island mineral soils are sufficiently deep to support closed boreal forest. In places, the forest soils exhibit a well-developed organic horizon that suggests long-term development without disturbance. Almost pure stands of white birch (*Betula papyrifera*) dominate the southwestern third of the island. To the north, balsam fir (*Abies balsamea*) assumes importance, giving rise to forests of mixed composition. At various localities, wetlands with concentrations of black spruce (*Picea mariana*) gain prominence. The maritime climate appears conducive to the development of the lichens that drape the mature trees.

The exposed rugged shore, dominated by cliffs and pebble beaches, provides no opportunity for forest development. Lichen barrens predominate on the rocky shores, while hardy flowering plants are found in humus-filled crevices and splash pools.

Several plants of biogeographical interest are known to occur on the island. The rocky shores support a number of species of arctic affinity, for example: encrusted saxifrage (*Saxifraga aizoön* var. *neogaea*), the insectivorous butterwort (*Pinguicula vulgaris*) and the sedge (*Scirpus cespitosus* var. *callosus*).

However, plants of arctic affinity are not as well represented here as at Ouimet Canyon and Cavern Lake Provincial Nature Reserves, and elsewhere along the shoreline of Lake Superior. Of greater interest is the occurrence of devil's club (*Oplopanax horridus*) in some parts of the forests. Populations of this thorny shrub from Porphyry Island, Isle Royale and nearby islands represent the only known occurrences east of the Rocky Mountains (Scoggan, 1979).

Management

Porphyry Island's location makes visitation difficult, and thus little protective management has been required. The natural history of the island has not been studied in depth to date.

The unauthorized collection of plants, animals or geological specimens from the Nature Reserve is a violation of *The Provincial Parks Act.*

Those wishing to conduct research on the island must obtain the approval of the District Manager.

Further Reading

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Administration

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Ontario Government Building,
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Ontario Ministry of Natural Resources

Hon. James A.C. Auld
Minister

W.T. Foster
Deputy Minister

This leaflet is one of a series from the publication: Parks and Recreational Areas Branch. 1981. *Provincial Nature Reserves in Ontario.* Ministry of Natural Resources, Toronto.

Trillium Woods Provincial Nature Reserve

5

General Information

In December 1964, the Woodstock Field Naturalists recommended that the Ontario Government purchase Trillium Woods to protect the population of trilliums.

The land base, consisting of one patent property, was purchased from the estate of Mr. Charles Amos Sealey in the Township of West Oxford. This Nature Reserve was placed into regulations under *The Provincial Parks Act* in 1970. The size of the Reserve is about 10 hectares (25 acres).

Natural History

Earth Sciences

Trillium Woods is located on the Zorra ground moraine which was created by glacial ice moving southeast out of the Lake Huron basin. The ground moraine is flat to gently undulating and is composed of the Tavistock (Zorra) till which has a silt to sand-silt texture (Cowan, 1975).

Soils are predominately silty and well-drained, even in low-lying areas. Drumlins may be observed in the immediate vicinity, and, to the south, glaciofluvial outwash sands mark a short stop in the retreat of the glacier.

Trail through closed deciduous forest.

Trillium Woods Provincial Nature Reserve

West Oxford Township

Source: Cowan (1975)

Aberrant trilliums (*Trillium grandiflorum*) illustrating variations in flower, form and degree of striping on petals.

Life Sciences

Trillium Woods is located on the northern limit of a region noted for the diversity of its southern deciduous forests, plants and animals. In spite of its location, the uniformity of habitat and size of the Nature Reserve limits the representation of biotic communities.

The well-drained soils support a young, homogeneous forest composed mainly of sugar maple (*Acer saccharum*), white ash (*Fraxinus americana*) and black cherry (*Prunus serotina*). Bitternut hickory (*Carya cordiformis*), beech (*Fagus grandifolia*) and butternut (*Juglans cinerea*) are important in places.

The profuse occurrence of unusual forms of the white trillium (*Trillium grandiflorum*) is a feature of long-standing interest to naturalists. Typically, white trilliums have three white petals set at approximately 120 degrees that alternate with three green petal-like appendages termed sepals. Deviations from this typical structure and colouration are widespread. Colour aberrations include green pigmentation in the petals that range from a pin stripe to a wide band along the central axis of the petal. In extreme forms the entire petal is green. Variations also occur in the size, shape and form of the plant.

The vegetation and wildlife of the Nature Reserve have yet to be documented in detail.

Management

Trillium Woods receives many visitors in May when the trilliums are in flower. Visitors are requested to walk on the footpath provided so that they do not trample plants or compact the soil.

The unauthorized collecting of trilliums and other plants and animals is prohibited under *The Provincial Parks Act.*

Those wishing to conduct research in the Nature Reserve must obtain the approval of the District Manager.

Further Reading

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Waldron, G. and S.G. Hay. 1971. Sweaburg Trillium Woods Nature Reserve. P. 344 *in* George H. LaRoi, Thomas A. Babb and Cheryl E. Perley (eds.). 1976. Canadian National Directory of IBP Areas. Alberta Printing Services, Edmonton.

Administration

District Manager, Aylmer District,
Ontario Ministry of Natural Resources,
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AYLMER, Ontario N5H 2S8

Telephone: (519) 773-9241

Ministry of Natural Resources
Ontario

Hon. James A.C. Auld
Minister

W.T. Foster
Deputy Minister

This leaflet is one of a series from the publication: Parks and Recreational Areas Branch. 1981. *Provincial Nature Reserves in Ontario*. Ministry of Natural Resources, Toronto.

Waubaushene Beaches Provincial Nature Reserve

General Information

This Nature Reserve was acquired on the recommendation of the Federation of Ontario Naturalists in 1966. The area was initially protected under *The Wilderness Areas Act* and in 1970 was placed into regulations under *The Provincial Parks Act*. The size of the Nature Reserve is about 34 hectares (84 acres).

Natural History

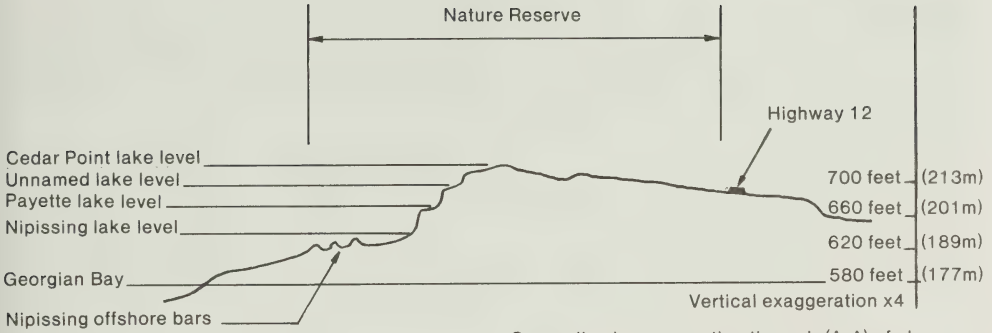
Earth Sciences
Waubaushene Beaches contains a sequence of ancestral Lake Huron-Georgian Bay shorelines, created over the last 12,000 years by rapidly changing water levels in the lake basin. The different water levels resulted from the retreat of the Wisconsinan glacier in the north and the erosion of river outlets in the south and east.

A portion of the most prominent of the ancestral lake stages, Lake Algonquin, may be observed outside the Nature Reserve along Highway 12 near Coldwater. Here, an erosional bluff was created by the ancient waves and currents of the lake. Falling water levels then created the Wyebridge Lake Stage, which is not evident in the vicinity of the Nature Reserve. However, good examples may be observed at Awenda Provincial Park, Giants Tomb Island Park Reserve and at Wyebridge. The continued fall of the water level created the Penetang Lake Stage. Shoreline features formed by this stage are best illustrated at their type locality near Penetanguishene.

Lakes Nipissing, Payette and unnamed erosional bluffs as viewed from sand plain in the northwestern portion of the Nature Reserve.

Waubaushene Beaches Provincial Nature Reserve

Tay Township



Generalized cross-section through (A-A) of abandoned shorelines in Waubaushene Beaches Provincial Nature Reserve (see accompanying map).

The oldest recognizable lake level within the Nature Reserve is the Cedar Point Stage. This stage is represented by a wave-cut terrace at 214 metres (703 feet) above sea level (a.s.l.). Some of this beach sand and gravel has been used as a source of aggregate. The resulting pits have since been abandoned, landscaped and the vegetation allowed to regenerate.

The water level eventually fell and an unnamed lake stage was formed at 212 metres (694 feet) a.s.l. This lake is represented by a strong bluff and boulder lag deposit which stretches across the Nature Reserve from northeast to southwest.

Again, the water level fell to create the Payette Lake Stage. This level is represented by a prominent bluff and wave-cut terrace at 205 metres (671 feet) a.s.l. The steeply sloped bluff which rises about 9 metres (30 feet) was carved by waves out of the abundant supply of debris deposited by previous lake stages. At the base of the bluff, ancient waves have removed all the finer materials lakeward, leaving a boulder lag deposit. There is an excellent view of Georgian Bay from the Reserve's higher elevations.

The water level continued to fall during the subsequent Shequindah, Korah, Stanley-Hough and Stanley-Nipissing Lake Stages. These lake stages were accompanied by a change in drainage from the south to the North Bay area. In the vicinity of the Nature Reserve they are found below the present level of Lake Huron.

Approximately 7,000 years ago drainage again shifted to the south through the St. Clair River. This shift was accompanied by rising water levels and the creation of the Lake Nipissing Stage. This lake stage is represented by a prominent bluff and wave cut terrace at 194 metres (637 feet) a.s.l. The Lake Nipissing bluff is steeply sloped and attains about 9 metres (30 feet) in height. It is immediately below the Payette bluff in the northwestern portion of the Nature Reserve, and in the northeastern portion it truncates the overlying Payette bluff. At the base of the bluff, boulder lag and offshore sand deposits mark the beach.

At a lower level another shoreline stretching from the northwestern corner of the Nature Reserve into the town of Waubaushene has been identified. This shoreline, called the Waubaushene Lake Stage (from which the Nature Reserve takes its name), is situated at the 188 metre (618 feet) a.s.l. elevation. The final lowering of the water level to the 177 metre (580 feet) a.s.l. elevation has given rise to the modern level of Lake Huron-Georgian Bay.

Life Sciences

The Nature Reserve lies in a region marked by a diversity of forest types and other biotic communities on deep mineral soils. Management of the landbase for agriculture prior to the designation of the Nature Reserve has determined the existing vegetation cover.

The area above the Nipissing bluff is abandoned agricultural land and pasture. Here, meadows interspersed with woodland groves and hedgerows predominate, and, in some places, woody plants are naturally re-established in the meadows. A small perched wetland offers another kind of habitat. Below the Nipissing bluff, successional woodlands, thickets and meadows are confined to the northeastern and the northwestern extremities of the Nature Reserve. A nearly continuous band of woodland occupies a seepage zone along the base of the bluff, interrupted only where gravel has been extracted. Sites of former gravel pits remain sparsely vegetated.

Management

The steep slopes and soils are prone to erosion. Below the bluff, wind has created deflation hollows in the sandy soils. Incompatible uses such as grazing and motorized vehicles could accelerate this erosion problem.

A Master Plan is being prepared for Waubaushene Beaches Provincial Nature Reserve. This plan will examine the requirements for and location of access, interpretive and research programmes and resource management.

The area presents a range of opportunities to study natural history and monitor community succession. Those wishing to conduct research must obtain the approval of the District Manager.

The unauthorized collection of plants, animals or geological specimens is prohibited under *The Provincial Parks Act.*

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The view across the erosional bluff, beach and offshore sands of the Nipissing lake stage to Georgian Bay.

Ontario Ministry of Natural Resources

Hon. James A.C. Auld
Minister

W.T. Foster
Deputy Minister

This leaflet is one of a series from the publication: Parks and Recreational Areas Branch. 1981. *Provincial Nature Reserves in Ontario.* Ministry of Natural Resources, Toronto.

Ouimet Canyon Provincial Nature Reserve

7

General Information

Ouimet Canyon Provincial Nature Reserve includes 777 hectares (1,920 acres) and was placed into regulations under *The Provincial Parks Act* in 1972. The land base was initially designated under *The Wilderness Areas Act*, which involved the designation of 712 hectares (1,760 acres) of Crown land and the acquisition of two patent properties containing about 65 hectares (160 acres).

Natural History

Earth Sciences
Ouimet Canyon and the surrounding region exhibit distinctive geology and geomorphology.

Early Precambrian, quartz-monzonite igneous intrusions, at the north end of Gulch Lake near the mouth of the canyon, are the oldest rocks within the Nature Reserve.

Late Precambrian sedimentary rocks of the Rossport Formation were deposited as mudstones within restricted sedimentary basins atop the older quartz-monzonites. These sediments, located in the southern portion of the Nature Reserve, are characterized by limited bedrock exposures, flat terrain and deep soils. Rock outcrops may be observed on the east and west shores of Gulch Lake and within the walls of the canyon.

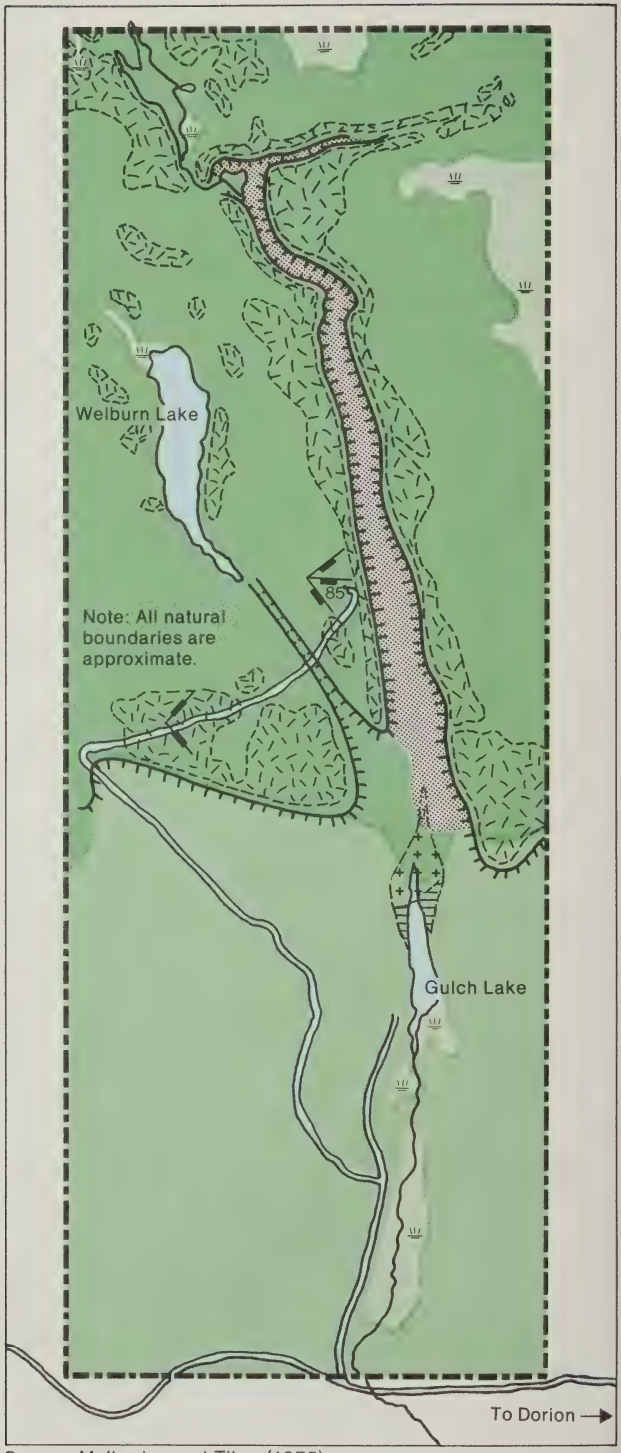
In the northern portion of the Nature Reserve, flat-topped mesas and vertical rock faces exceeding 100 metres (329 feet) in height are prominent.

Lichen barrens on canyon walls and talus slopes separated by palisade forest as viewed south from north end of Ouimet Canyon.

Ouimet Canyon
Provincial Nature Reserve

Dorion Township

- Mixed boreal forest
- Early successional deciduous forest
- Unforested wetlands
- Cliff and talus barrens with woodlands & 'tundra' inclusions
- Escarpment face
- Diabase
- Rossport sediments
- Quartz monzonite
- Jointing orientation vertical/inclined (85°)
- Nature Reserve boundary



0 1.0
Kilometres

Source: McIlwaine and Tihor (1975)

The mesas, named the "Logan Sills" after Sir William E. Logan, the father of the Canadian Geological Survey, are diabase intrusions (approximately 1,142 million years old) into older sedimentary rocks. All these features are characteristic of the surrounding region. The diabase is prominently jointed or cracked in north-south and east-west directions, while less prominent jointing occurs horizontally and in southeast, northeast to southwest directions.

The bedrock's physical character, its jointing pattern and the geological process have all contributed to the evolution of the canyon. Freezing and thawing of water within the jointing planes have freed large boulders from the main body of the outcrop. The north-south jointing pattern along the line of today's canyon was probably closely spaced and particularly susceptible to this process. The resulting surface rubble was removed by glacial ice which moved from north to south, thus scouring out a long shallow depression, an early stage of the development of Ouimet Canyon. Successive warm periods of seasonal freeze and thaw followed by cold periods of glaciation accentuated the canyon's morphology.

Today, the canyon is approximately 150 metres (492 feet) wide, 100 metres (329 feet) deep and 2.4 kilometres (1.5 miles) long. Jointed diabase columns, susceptible to erosion, are the dominant feature of its vertical walls, and their continued erosion contributes to the accumulation of the talus slopes along the canyon floor.

Life Sciences

Ouimet Canyon is located in a distinctive region of the Boreal Forest marked by prominent patterns of biotic communities associated with the mesas, escarpments and canyons that characterize the Lakehead region. In this respect, Ouimet Canyon duplicates many of the environmental conditions found at Cavern Lake Provincial Nature Reserve.

The mesas generally support mixed boreal forests. On thin soils, evergreen-deciduous forests of jack pine (*Pinus banksiana*), spruces (*Picea* spp.), balsam fir (*Abies balsamea*) and white birch (*Betula papyrifera*) predominate. Lichen woodlands of similar composition occur where exposed bedrock prohibits the development of closed forests. The views from the rim of the canyon, where these open woodlands predominate, are very impressive. Sites with substantial mineral soils often support successional forests of trembling aspen (*Populus tremuloides*) and white birch with mixtures of conifers in some stands. In the southern section, even-aged, successional deciduous forests of trembling aspen show that logging activity predated the establishment of the Nature Reserve. Lowland forests, which occur in the north-eastern section, are often characterized by black spruce (*Picea mariana*), white cedar (*Thuja occidentalis*) and, in some places, black ash (*Fraxinus nigra*). Non-forested wetlands are concentrated south of Gulch Lake.

Within the canyon, ecological conditions are extreme. The arid canyon walls present hostile conditions for plant life. Lichens dominate the cliff faces and vascular plants are found only in crevices and jointing patterns in the bedrock. Along the base of the cliffs, finely sorted talus supports a linear grove of white birch. This palisade forest separates the lichen barrens that dominate the arid talus slopes. Vegetation on the canyon floor is luxuriant, with thick moss cushions supporting 'subarctic' thickets of black spruce. Late spring snow melt, delayed seasonal development of the vegetation, suppressed growth of some flowering plants and the persistence of subarctic plants are all evidence of colder than normal conditions along the canyon floor.

Management

A Master Plan has been completed for Ouimet Canyon which guides development and management within the Reserve. The canyon provides a range of opportunities for natural history study and interpretation. Those wishing to conduct research in the Nature Reserve are required to obtain the approval of the District Manager.

Although views from the rim of the canyon are spectacular, visitors should stay in designated viewing areas and walk only on the marked trail, as there is a constant risk of rock collapse at the edge. Visitors should not hike along the canyon floor because of the danger of rock slides, and because pedestrian traffic quickly erodes the sensitive vegetation.

Jointing planes in diabase, viewed horizontally in foreground and vertically in background. Fragile crusts of lichens and mosses cover the diabase.

The unauthorized collection of plant, animal or geological specimens is a violation of *The Provincial Parks Act.*

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Coarse boulders on the canyon floor are habitat for many plants characteristic of more northern climates.

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Minister
W.T. Foster
Deputy Minister

This leaflet is one of a series from the publication: Parks and Recreational Areas Branch. 1981. *Provincial Nature Reserves in Ontario.* Ministry of Natural Resources, Toronto.

Cavern Lake Provincial Nature Reserve

8

General Information

The size of Cavern Lake Provincial Nature Reserve is about 189 hectares (467 acres). The land base was initially designated under *The Wilderness Areas Act*, which required the acquisition of one patent property containing about 72 hectares (177 acres). The remaining area, about 117 hectares (290 acres), was Crown land. The Nature Reserve was established to protect geological features, subarctic flora and a bat cave. In 1975, the Reserve was placed into regulations under *The Provincial Parks Act*.

Natural History

Earth Sciences

This Nature Reserve is geologically similar to Ouimet Canyon Provincial Nature Reserve. Both Reserves contain the same early Precambrian quartz monzonite and late Precambrian diabase. As in Ouimet, a canyon over 48 metres (156 feet) deep has formed along jointing planes. The floor of the canyon is dominated by well-sorted talus slopes. The Nature Reserve exhibits the mesa, escarpment and canyon topography characteristic of the Port Arthur Hills.

The presence of a cave makes Cavern Lake different from Ouimet Canyon. The cave is situated in the quartz monzonite near its contact with the

Lichen barrens on talus slopes and forests surrounding Cavern Lake as viewed south from the rim of the canyon.

Source: McIlwaine and Tihor (1975)

Fir-club-moss (*Lycopodium selago* var. *patens*) inhabits lichen-covered diabase blocks on the canyon floor.

Arctic pyrola (*Pyrola grandiflora*) abounds on moss-covered diabase blocks on the canyon floor.

overlying diabase, and its entrance is located about 27 metres (89 feet) above Cavern Lake. The wide, low entrance measures approximately 20 metres (63 feet) by 2.5 metres (8 feet) at the highest point, and is partially filled with talus. The cave extends approximately 13 metres (43 feet) along a horizontal plane from front to back, and its floor is strewn with rock rubble that has collapsed from the roof.

The Cavern Lake cave is claimed to be the longest cave in Precambrian rocks in Ontario, and possibly Canada (Tracey, 1973). Small stalactites approximately 2-3 centimetres (about 1 inch) in length hang from the roof of the cave.

Life Sciences

The Nature Reserve lies in a distinctive region of the Boreal Forest surrounding the Lakehead where striking patterns of vegetation coincide with the dramatic mesa and canyon topography.

Generally, forests of trembling aspen (*Populus tremuloides*), white birch (*Betula papyrifera*), balsam fir (*Abies balsamea*), jack pine (*Pinus banksiana*) and spruces (*Picea* spp.) surround the canyon on mineral soils. Lichen woodland occurs on outcrops along the canyon rim and elsewhere in the Nature Reserve.

Compared to the forested mesas, environmental conditions in the canyon are extreme. Late spring snow melt and low solar insulation contribute to colder than normal conditions along the canyon floor. These conditions permit the persistence of enclaves of 'subarctic' thickets of black spruce (*Picea mariana*) that have developed on deep organic mats atop the coarse boulder talus. In this habitat, black spruce propagate by layering, a type of reproduction whereby plants develop from branches that root in organic substrates.

At higher elevations along the talus slope lichen barrens predominate. This desert-like environment is separated from equally arid cliffs by a narrow palisade forest of white birch that has developed on the finely sorted talus at the base of the cliffs. Lichen cover predominates on the cliff faces, its absence usually indicating relatively recent rock falls.

Many plants of arctic, subarctic or alpine affinity inhabit the canyon floor. Notable species include: alpine woodsia (*Woodsia alpina*), arctic pyrola (*Pyrola grandiflora*), encrusted saxifrage (*Saxifraga aizoön* var. *neogaea*), fragrant shield fern (*Dryopteris fragrans*), alpine bistort (*Polygonum viviparum*), fir-club-moss (*Lycopodium selago* var. *patens*), and a prostrate willow (*Salix myrtillifolia*). The occurrence of these species in the Lake Superior region represent significant range extensions from their centres of distribution.

Still other aspects of the vegetation on the canyon floor suggest subarctic conditions. The growth form of woody species is often suppressed and the seasonal growth of the vegetation is delayed markedly in the spring compared with that of nearby mesas.

The cave is of special zoological interest as both a summer roosting site and a hibernaculum or wintering den for bats. Four species of bats have been reported as frequenting the cave: the little brown bat (*Myotis lucifugus*), the big brown bat (*Eptesicus fuscus*), the rarer Keen's long-eared bat (*Myotis keenii septentrionalis*) and the red bat (*Lasiurus borealis*) (Woodside and Buchanan, 1975).

Management

Access to Cavern Lake Provincial Nature Reserve is permitted, but not encouraged, since the Reserve is regarded as particularly sensitive. Entry may be limited during certain parts of the year or in parts of the Reserve. The cave is especially sensitive since exploration can readily destroy features such as stalactites. The bats are particularly susceptible to human intrusion during swarming activity from July through September and during hibernation through winter. It is most critical that they should not be disturbed during hibernation when arousal and activity can rapidly deplete fat reserves, the stored food source that they use to survive through winter. The vegetation of the canyon is also very sensitive to human traffic.

To date, natural history studies have focused on the flora of the canyon and behavior of the bats. The area provides excellent opportunities for scientific research. Anyone wishing to conduct research must obtain the approval of the District Manager.

The unauthorized collection of plants, animals or geological samples is prohibited under *The Provincial Parks Act.*

Visitors are warned of the perpetual hazard of rock falls and slides in the canyon.

Further Reading

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Ontario Ministry of Natural Resources
Hon. James A.C. Auld, Minister
W.T. Foster, Deputy Minister

This leaflet is one of a series from the publication: Parks and Recreational Areas Branch. 1981. *Provincial Nature Reserves in Ontario.* Ministry of Natural Resources, Toronto.

East Sister Island Provincial Nature Reserve

General Information

East Sister Island was purchased in 1972 to protect special wildlife features. The entire island was designated under *The Wilderness Areas Act* before being placed into regulations under *The Provincial Parks Act* in 1976.

The Nature Reserve's total area is about 53 hectares (131 acres). The Reserve includes the entire island, about 15 hectares (36 acres), and the remaining area extends into Lake Erie about 123 metres (400 feet) perpendicular to the shore.

Natural History

Earth Sciences

East Sister Island and adjacent islands represent the emergence from Lake Erie of two escarpments eroded down to Silurian and Devonian bedrock. In the Nature Reserve, dolomite that probably belongs to the Bass Island Formation is exposed at the eastern point and along the northwestern shore. Detailed evaluation of the island's bedrock is required to determine its true nature.

From the excellent examples of glacial striae and grooves which can be seen, it is evident that the island's bedrock has been scraped and scoured by glacial ice. It was subsequently covered by clay and silt deposited in a series of lakes which occupied the Lake Erie basin immediately after the retreat of the glacier.

The bedrock has subsequently been subjected to chemical and physical weathering. Chemical action

Closed deciduous forest of hackberry (*Celtis occidentalis*) and black maple (*Acer nigrum*) at the east end of the island.

East Sister Island Provincial Nature Reserve

Pelee Island Township

Predominantly closed deciduous forest

Unforested wetland

Unforested coastal habitat

Storm beach

Clay and silt

Bedrock outcrops

Nature Reserve boundary

of water has eroded pits and rills in exposed bedrock. The physical action of waves has eroded the bedrock and deposited a series of cobble beaches which rim the island. The interior is thinly soiled, low and wet.

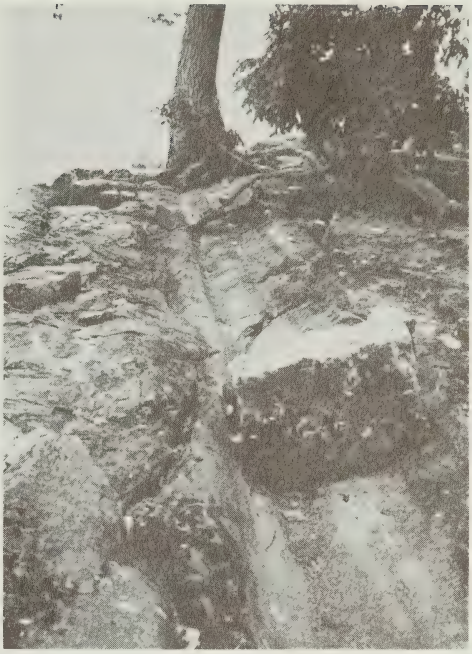
Life Sciences

The natural history of the Erie Archipelago has been influenced dramatically by European settlement. However, though all of the large islands have been logged and cleared, East Sister Island has escaped this intrusion, and today, it represents better than any other island, some aspects of the pre-settlement character of the Erie Archipelago.

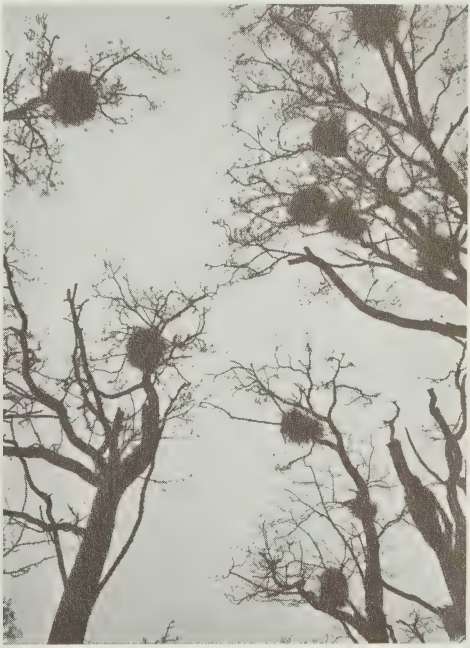
The ecology of the island reflects the regional climate and soil conditions. Except along the shoreline, clay soils of sufficient depth to bear forests mantle the bedrock. On the east end of the island a modest slope provides adequate drainage to sustain a forest of black maple (*Acer nigrum*) and hackberry (*Celtis occidentalis*). This woodland merges with a low-lying forest on the western end of the island that includes mixtures of American elm (*Ulmus americana*), red ash (*Fraxinus pennsylvanica*), Kentucky coffee-tree (*Gymnocladus dioica*), silver maple (*Acer saccharinum*), and hackberry. Dense thickets have developed in the centre of the island in forest clearings where trees have been blown down. There are no trees on the rocky shoreline and in a small wetland on the southwest end of the island. The island is significant for its southern flora and represents perhaps the most significant location in all of Canada for several species such as the Kentucky coffee-tree and Short's aster (*Aster shortii*). More than a dozen plants listed as rare for Ontario by Argus and White (1977) have been reported on the island.

The fauna is also exceptional. In the west central part of the island a Kentucky coffee-tree stand provides sanctuary for a large heronry. This heronry represents a major breeding colony for great blue herons (*Ardea herodias*) and black-crowned night herons (*Nycticorax nycticorax*) which have nested here for decades. In recent years, great egrets (*Casmarodius albus*) have also occupied the heronry, and the Royal Ontario Museum has a single nest record for yellow-crowned night herons (*Nyctanassa violacea*).

The coastal area provides habitat for a variety of waterfowl and shorebirds. Many herring gulls (*Larus argentatus*) nest on the rocky shoreline. The island also provides refuge for several snakes, notably the fox snake (*Elaphe vulpina gloydi*) and the Lake Erie water snake (*Nerodia sipedon insularum*).



Boulder scraper in glacial groove at eastern end of island.



Heronry in Kentucky coffee-trees (*Gymnocladus dioica*).

Management

East Sister Island offers unique opportunities for study of the principles of island biogeography and the biology of organisms approaching their northern range limit. The need to research more fully the ecology and the biota of the island must be tempered with due consideration for its environmental sensitivities. Intrusions should be limited especially when the heronry is occupied during May through August.

The unauthorized collection of plants, animals and geological specimens is prohibited under *The Provincial Parks Act*.

Those wishing to conduct research within this Reserve are required to obtain the approval of the District Manager.

Further Reading

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Ministry of Natural Resources
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This leaflet is one of a series from the publication: Parks and Recreational Areas Branch. 1981. *Provincial Nature Reserves in Ontario*. Ministry of Natural Resources, Toronto.

Peter's Woods
Provincial Nature Reserve

10

General Information

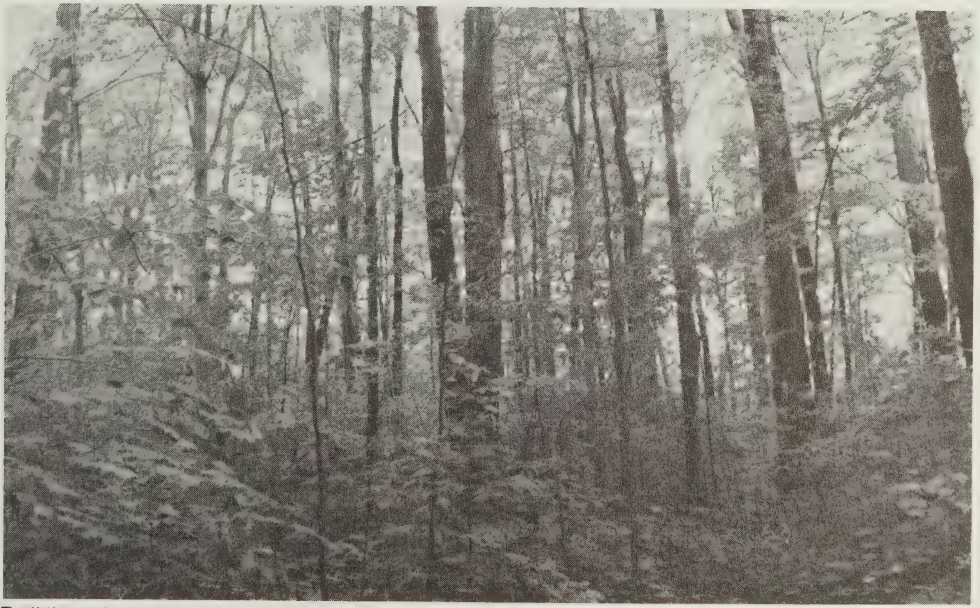
This Nature Reserve originated with the purchase of one patent property containing 34 hectares (82.61 acres). The acquisition cost was shared between the Ontario Government, the Willow Beach Field Naturalists Club and friends of the late A.B. (Peter) Schultz. The woodlot and its exceptionally large trees are dedicated to the memory of Mr. Schultz, the former publisher of the *Port Hope Evening Guide*. The area was initially established under *The Wilderness Areas Act*, but was placed into regulation under *The Provincial Parks Act* in 1976.

Natural History

Earth Sciences

Peter's Woods is located on the northern slope of the Oak Ridges moraine. Here, moraine sand and gravel are covered by a thin veneer of brown calcareous till, all deposited during the Wisconsinan glaciation by separate advances of ice.

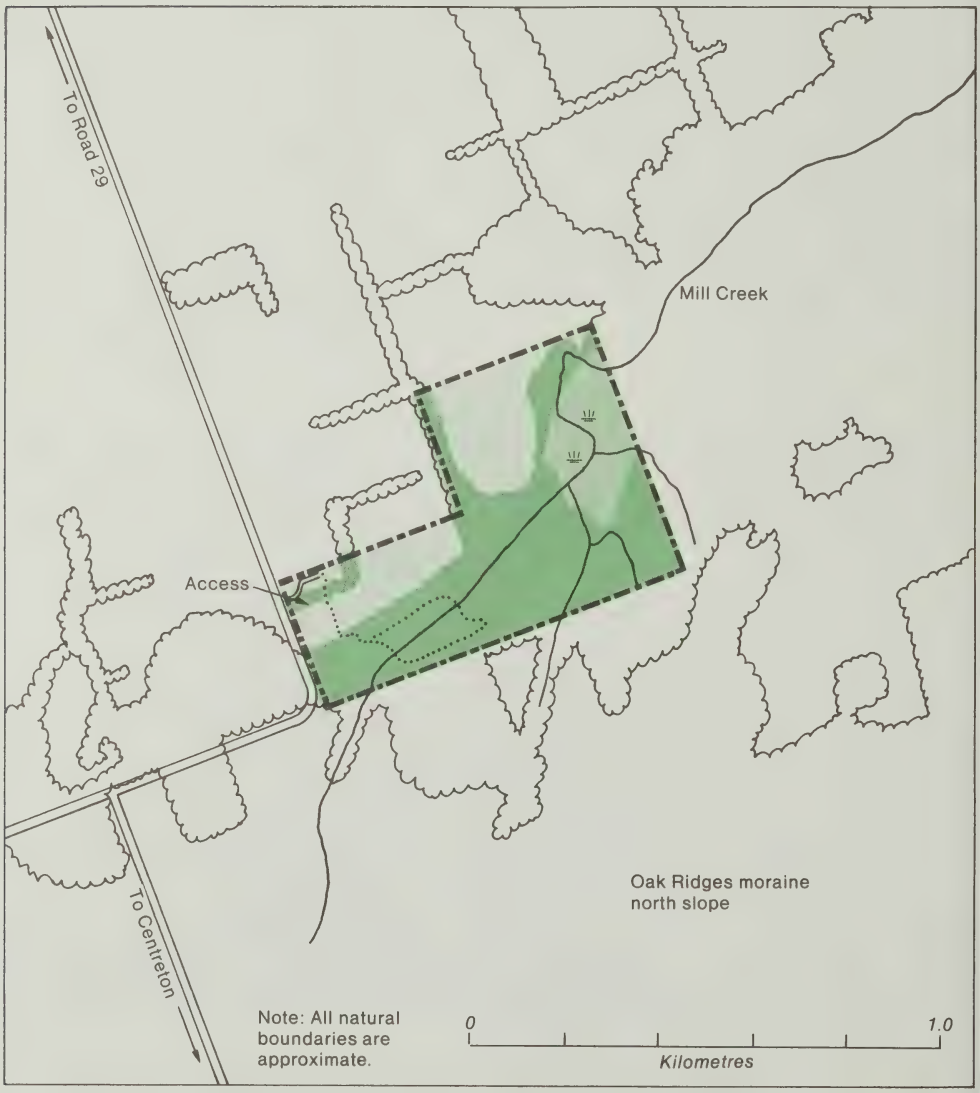
After the retreat of the last glacier, the erosive action of surface water on unvegetated slopes carved steep sided valleys into the north slope of the moraine. These valleys are now occupied by headwater springs and streams of Mill Creek. The valleys are called 'misfit' as they do not have the capacity to erode the valleys that they occupy.



Trail through closed deciduous forest.

Peter's Woods
Provincial Nature Reserve

Haldimand Township



Mature white pine (*Pinus strobus*) protruding through forest canopy.

Life Sciences

Peter's Woods lies in a region marked by its diversity of vegetation and wildlife, but the Reserve's range of habitats is small because of its size. It incorporates well-drained uplands and poorly drained lowlands with organic soils in places.

The vegetation reflects the topography, soil conditions and earlier human influence. In the southwest, closed deciduous forest predominates on the sloping, well-drained uplands. Here, sugar maple (*Acer saccharum*), beech (*Fagus grandifolia*), and red oak (*Quercus rubra*) are some of the trees which occur. In the southeast, the forest assumes an evergreen-deciduous character as hemlock (*Tsuga canadensis*) and white pine (*Pinus strobus*) gain importance. These upland forests are significant because of the scattered trees of exceptional size which grow there. The poorly drained wetlands in the east support a forest of white cedar (*Thuja occidentalis*), with local concentrations of red ash (*Fraxinus pennsylvanica*), white birch (*Betula papyrifera*) and other trees. Common cat-tail (*Typha latifolia*) and other wetland herbs inhabit local clearings.

The post-agricultural lands in the northwest are located on flat to sloping well-drained terrain. Since the establishment of the Nature Reserve, farming these lands has been discontinued. Surrounding forests and mature hedgerows of trees and shrubs are a viable seed source for the re-establishment of woodlands. Already, succession is evident as woody plants invade the fields.

Preliminary lists of vascular plants, birds, reptiles and amphibians have been compiled for the area.

Management

A Master Plan for Peter's Woods has been prepared to guide development and management within the Reserve. The plan provides for the protection of the woodlands and for the natural succession of the post-agricultural lands.

Visitors are requested to use foot trails so that the vegetation is not trampled, nor the soil compacted. The steep slopes are susceptible to erosion which could increase siltation in the stream.

The unauthorized collecting of plants, animals or geological specimens is a violation of *The Provincial Parks Act.*

Those wishing to conduct natural history research are required to obtain the approval of the District Manager.

Further Reading

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Ontario
Ministry of Natural Resources
Hon. James A.C. Auld
Minister
W.T. Foster
Deputy Minister

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Ojibway Prairie Provincial Nature Reserve

11

General Information

The significance of the Ojibway Prairie was not widely recognized until the early 1970's when P.F. Maycock, Plant Ecologist, University of Toronto, and the late G.A. Hills, Soil Scientist, Ontario Department of Lands and Forests, reported the area to the Minister's Advisory Committee on Nature Reserves.

The City of Windsor, the Province of Ontario and The Nature Conservancy of Canada each contributed to the acquisition of 24 patent properties totalling about 90 hectares (223 acres) in area. In 1970, about 65 hectares (165 acres) were placed into regulations under *The Provincial Parks Act.* The City of Windsor operates a municipal park immediately adjacent to the Reserve.

Natural History

Earth Sciences
Far beneath the surface of the Ojibway Prairie lie the limestones and evaporites of the Dundee and Salina Formations. The latter is known for its marketable layers of salt. In the vicinity of the Nature Reserve there are several active salt mining operations.

Approximately 30 metres (100 feet) of unconsolidated deposits are found on top of the bedrock. From bedrock to surface, these deposits consist of a thin layer of sandy till, a thick layer of clay till and a thin layer of sands and silts. The tills were deposited by glacial ice during the Wisconsinan glaciation, and the surface sands and silts were deposited into a short-lived, post-glacial Lake

Forb prairie grading into pin oak woodland in the northwest corner of the Nature Reserve.


Ojibway Prairie
Provincial Nature Reserve
Sandwich West Township
Predominantly native prairie and savanna
Hedgerow, thicket and woodland
Reclaimed agricultural land
Sand and silt
Nature Reserve boundary
0
1.0
Kilometres
Ojibway Park
City of Windsor
Titcombe Road
Sprucewood Avenue
Matchette Road
Malden Road
Note: All natural boundaries are approximate.

Rouge. This lake ultimately drained through what is known today as Big Creek.

The distribution of surficial materials results in very localized ground water conditions. In the spring, the prairie is saturated through natural precipitation. Water is trapped by the impermeable clay till and stored in the sands and silts. By September it is lost through evaporation and transpiration. The vegetation of the prairie is dependent on this cycle. The Nature Reserve is monitored and managed to insure that this natural process continues.

Life Sciences

Early accounts of extensive prairies in southwestern Ontario are corroborated by the occurrence of mineral soils high in organic content in Kent, Essex and Lambton Counties. Because the soil was very fertile, and the flat, treeless land easy to till, Ontario's prairies were quickly developed for agriculture. Today, Ojibway Prairie persists as the largest protected remnant of native prairie in Ontario and one of the finest remaining representative tracts of prairie in Canada.

The environmental conditions at Ojibway are similar in many respects to prairies in the west. Fine-textured soils derived from waterlaid sands and silts predominate. This substrate, combined with a low relief landscape, a perched water table, local climatic conditions and periodic fires, has favoured the persistence of prairie vegetation over the development of deciduous forests more characteristic of the surrounding region.

The vegetation includes a complex of native prairie and reclaimed agricultural land. The prairie complex includes substantial tracts of untilled tall grass prairie and a variety of forb prairies which occupy approximately the northern half of the area. In the northwest, these prairies merge with an open woodland of pin oak (*Quercus palustris*) producing a community termed savanna. The southern portions include reclaimed agricultural lands punctuated with hedgerows and woodland.

The Nature Reserve has a diverse flora significant for its geographical relations and rare plants. Of the 533 flowering plants discovered in and around the Nature Reserve, more than 60 are of prairie and western affinity. Important plant families at Ojibway include many families usually well-represented in prairies: composites (Compositae), grasses (Gramineae), figworts (Scrophulariaceae), mints (Labiatae) and lilies (Liliaceae). Approximately 18 percent of the entire vascular flora is listed as rare in Ontario by Argus and White (1977).

The fauna also exhibits southern and western influences. Butler's garter snake (*Thamnophis butleri*), bobwhite (*Colinus virginianus*) and yellow-breasted chat (*Icteria virens*) are three species of interest in this regard.

Inventories of vascular plants and some faunal groups have been initiated, but much survey work remains to be done to describe fully the biota.

Ironweed (*Veronia altissima*), a prairie forb rare in Ontario.

Management

The principle management objective is the maintenance of native prairie and the restoration to prairie of reclaimed agricultural land. This management objective calls for prescribed burns, since fire is a natural process that arrests the invasion of woody non-prairie plants, but does not eradicate the prairie plants that are adapted to fire.

The Nature Reserve provides substantial opportunities for scientific study and environmental monitoring to expand our understanding of prairie ecology. Already the prairie has been the subject of various studies including groundwater modelling, soils mapping, vegetation surveys and inventories of various groups of organisms. Anyone wishing to conduct research in the Nature Reserve is required to obtain approval through the District Manager.

The late summer is the best season to visit the prairie for it is at this time that the grasses and forbs are flowering and the prairie is ablaze with colour.

Visitors may also hike through prairie vegetation at Ojibway Park, operated by the City of Windsor, and west of Matchette Road. It has an excellent prairie interpretive centre and is frequently visited by school groups.

The unauthorized collection of any plants, animals or geological specimens is a violation of *The Provincial Parks Act.*

Further Reading

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Administration

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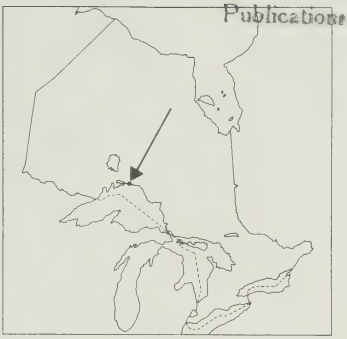
Schreiber Channel Provincial Nature Reserve



12

General Information

Schreiber Channel Provincial Nature Reserve was established to protect one of Ontario's most significant rock outcrops. A land base of about 13 hectares (32 acres) in Killraine Township, District of Thunder Bay was transferred from Crown land to Provincial Park status by placing the area into regulations under *The Provincial Parks Act* in 1979.

Natural History

Earth Sciences

The rock outcroppings of this Nature Reserve and those of Kakabeka Falls Provincial Park contain, "By far the best known, best preserved, and most diverse assemblage of micro-fossils in the Precambrian of North America" (Hofmann, 1971, p. 45).

The most significant outcrop occurs at Schreiber Channel on the Lake Superior shoreline. Here, metamorphosed, Early Precambrian volcanic rocks are overlain unconformably by the Middle Precambrian, basal conglomerate member of the Gunflint Formation. This dramatic contact spans an erosional interval of up to 500 million years. The basal or "Kakabeka" conglomerate is distributed sparsely throughout the region but is probably displayed best at this site. The lower algal chert member of the Gunflint Formation rests conformably on the basal conglomerate, and is internationally known for its microfossils.

The microfossil site is found within a narrow band of algal chert approximately 37 metres (121 feet) by 8 metres (26 feet). Small stromatolitic mounds consisting of black, white and grey chert,

The Gunflint sediments exposed on Flint Island provide habitat for nesting shorebirds.

Schreiber Channel Provincial Nature Reserve

Killraine Township

Predominantly closed boreal forest

Unforested coastal habitat

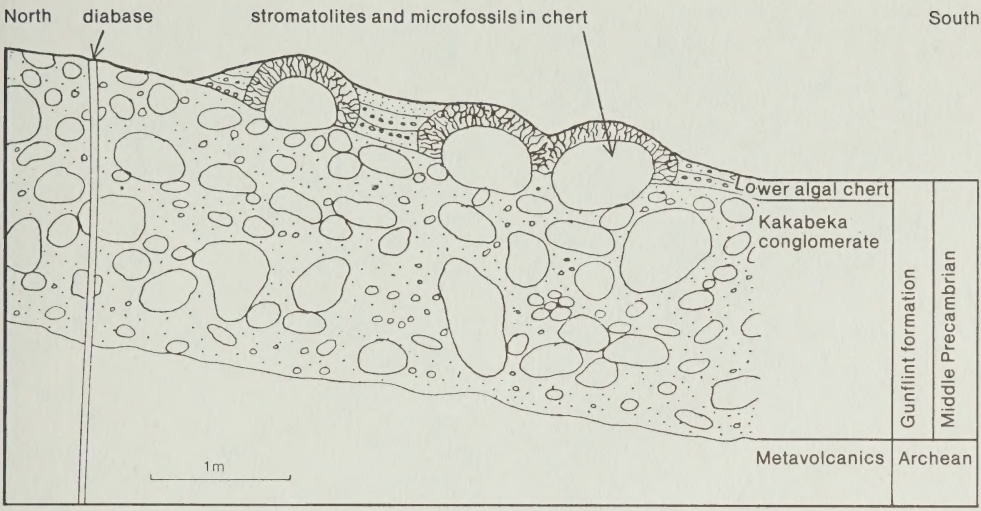
Gunflint formation outcrops

Metavolcanic outcrops

Geological boundary

Nature Reserve boundary

Source: Harcourt (1939)



Generalized cross-section of bedrock showing the relationship of rock strata and microfossils.

surrounding, in most cases, a boulder nucleus, are found in the outcrop. The boulders originate from within the basal conglomerate and the mounds range in size from a few centimetres to 0.8 metres. The fractured outcrop surfaces dip southwest beneath the waters of Lake Superior.

The Gunflint microfossils are extremely significant. Their entire assemblage consists of sixteen taxa which fall into blue green algae, budding bacteria and unknown affinity categries. Two of these categories also have been recorded at a few localities in northern Canada and Australia, but the taxa of the unknown affinity category are found only in the Gunflint Formation. Awarmik and Barghoorn (1977, p. 128) suggest that these forms probably represent morphological "experimentation" during a time when the earth's atmosphere was changing from one low in oxygen to one with significant amounts of free oxygen.

Life Sciences

Schreiber Channel lies in a distinctive region of the Boreal Forest where vegetation patterns are influenced by the rugged landform characterizing the northeast coastal region of Lake Superior.

Closed deciduous-evergreen forests dominate the rugged, steep slope facing Lake Superior. White birch (*Betula papyrifera*), trembling aspen (*Populus tremuloides*) and balsam fir (*Abies balsamea*) are important trees in this forest type. Open woodlands grow on bedrock outcrops in the extreme southeast corner of the Reserve.

Exposure and shoreline processes and an absence of mineral soil combine to limit the forest edge along the coast. Here, habitat conditions vary from rugged bedrock shore on the east to cobble beach on the west. A sparsely vegetated, weathered bedrock exposure extends a short distance inland midway along the shore.

Biological information about the Nature Reserve is limited to that available from map and air photo interpretation.

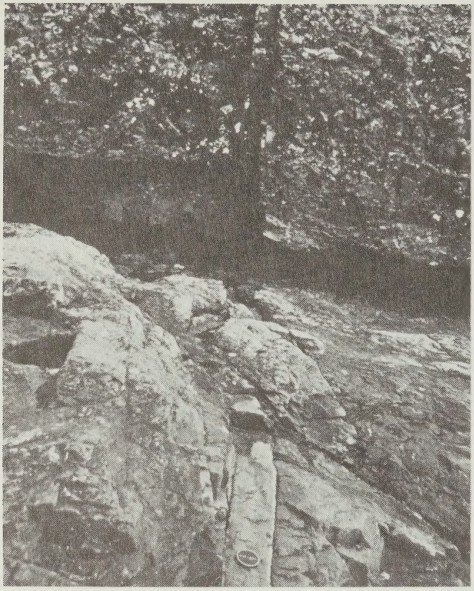
Management

Schreiber Channel Provincial Nature Reserve is managed to protect its significant geologic and paleontologic features and to maintain the outcrop's natural conditions.

A Master Plan will be prepared to determine the need for and location of access facilities, interpretive displays, signs and trails. This plan also will establish a policy for the collection of rocks and fossils.

In the past, the relative inaccessibility of this site has *not* prevented amateur and professional collectors from removing samples from it. Because the exposure is small, collecting has endangered the outcrop. Accordingly, only authorized collecting for scientific research will be permitted.

The unauthorized collecting of rocks, fossils, plants or animals is prohibited under *The Provincial Parks Act.* Those wishing to conduct research on the



The Early Precambrian-Middle Precambrian unconformity separates the Kakabeka conglomerate (above) and the metavolcanic (below).

Stromatolite bioherms in outcrop at Schreiber Channel Provincial Nature Reserve.

natural history of this Nature Reserve, or remove samples from it, must obtain the approval of the District Manager.

Further Reading

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